



Request for Proposal – San Marcos Training Tower

**186 Santar Place
San Marcos, CA
92069**

December 29, 2021



REQUEST FOR PROPOSAL – San Marcos Training Tower

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1. BACKGROUND

San Marcos Training Tower, 186 Santar Place, San Marcos, CA 92069

Contacts:

Owner:

City of San Marcos
c/o IDS Real Estate Group
Attn: Fay Ryan
785 Street
San Diego, CA 92101
619-961-1981
fryan@idsrealestate.com

Construction Manager and
main point of contact:

IDS Real Estate Group
Attn: Christopher Maurer
785 J Street
San Diego, CA 92101
619-961-1980
cmaurer@idsrealestate.com

Architect:

PBK-WLC
8163 Rochester Avenue, Suite 100
Rancho Cucamonga, CA 91730
909-987-0909

Structural Engineer:

R. M. Byrd and Associates, Inc.
1047 West Sixth Street, Suite A
Ontario, CA 91762
909-983-5599

Prevailing Wage:

Gafcon, Inc.
Attn.: Song LeBaron
5960 Cornerstone Ct. W, Suite 100
San Diego, CA 92121
858-875-0010
slebaron@gafcon.com



2. THE PROJECT

1. Address 186 Santar Place, San Marcos, CA 92069
2. Site Visit The submission of a proposal shall bear evidence that Contractor has reviewed and has become familiar with the site and is fully aware of the existing conditions under which Contractor's work must be performed.
3. Schedule

Pre-Submittal Meeting	January 12, 2022
Proposal RFI's Due	January 14, 2022
Proposal RFI Answers Posted	January 19, 2022
Proposals Due	January 26, 2022
Project Award	TBD
Construction Duration	Two (2) weeks max.
4. Construction

Provide all elements required to construct the project in accordance with the request for proposal, drawings, specifications, and all applicable codes and regulations of governing authorities having jurisdiction of the work.

The work shall be completed on time and in a safe and quality manner. Full-time on-site supervision is required. All labor costs subject to prevailing wage requirements, and pursuant to Labor Code Section 1770 et seq., the Contractor and each subcontractor performing work under the Contractor for the Project shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. And, pursuant to Labor Code Section 1776, the Contractor and each subcontractor performing work under the Contractor for the Project shall keep and submit accurate certified payroll records to Gafcon, Inc. (the City's Labor Compliance Consultant-see attachment) and electronically to the Labor Commissioner via the Department of Industrial Relation's electronic certified payroll reporting system.

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5. Testing and Inspection Testing and inspection costs are by Owner. Contractor shall coordinate all testing and inspection as required.



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|----------------------|--|
| 6. Permits | Any building plan check and permit fees are by Owner.
All trade permits and fees are by Contractor. |
| 7. Pricing breakdown | Per proposal form included in RFP section 5 – Owner
Furnished Documents. |



3. REQUEST FOR PROPOSAL – San Marcos Training Tower, 186 Santar Place

We request lump sum proposals and presentation of qualifications to accomplish the project. Proposals should include any information, facts, experience, processes, and philosophy that illustrate unique qualifications to successfully complete the work.

Proposals are to be emailed to Christopher Maurer (cmaurer@idsrealestate.com) no later than 12:00pm (noon) on the due date. In the email containing the proposal, proposers shall request either a read receipt or a reply with confirmation of receipt.

Owner will consider all factors in the selection process. Contractor selection will be based on the following:

Evaluation Factor	Weight
Completeness of Response Responses to this RFP must be complete. Responses that do not include the proposal content requirements identified within this RFP and subsequent addenda will be considered incomplete, and will be rated a “Fail” and will receive no further consideration. Response shall demonstrate that Contractor has reviewed and become familiar with the site and is fully aware of the existing conditions.	Pass/Fail
Conflict of Interest Provides and discloses relevant potential conflicts of interest.	Pass/Fail
Price Value of proposer’s work based on fair and reasonableness of cost and fee schedule.	30
Experience Successful performance on similar projects (within the past three years)	20
References Demonstrate successful performance of similar projects based on clients’ review of project work, contractor’s cooperation, and adherence to schedule and budget.	5
Schedule Demonstrates that the work can be completed timely	45



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At a minimum, proposals should address the following:

1. Background Provide general information including:
 - a. Office locations;
 - b. Period the firm has been in business;
 - c. Business organization i.e., corporation, partnership, or sole proprietorship;
 - d. Officers of the firm;
 - e. Areas served (local, national, international);
 - f. Describe services directly performed;

2. Experience Offer past projects of similar nature and scope that establish abilities to perform the project;

3. Subcontracting Discuss consideration of using subcontractors for any items;

4. Scheduling Include a preliminary schedule in Gantt format showing a project start date, lead time items, major activities, milestones (including submittal return dates), and a substantial completion date;

5. Safety Non-construction personnel must be kept safe at all times. This will include items like wayfinding signage, flagmen, barricades, temporary canopies, etc. Identify the measures that will be taken to ensure a safe project that are included in your proposal;

6. Operating Environment Throughout the construction period, parts of the facility will be operating with access allowed to the tenant and members of the general public. Include details of past experiences working in this type of environment along with specific challenges faced and how they were overcome. Include maps or sketches designating your proposed laydown zone(s) and any other areas that will be restricted to contractor use only;

7. Agreement It is our intent to utilize the Construction Services Agreement (Short Form / Lump Sum) included with



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this RFP. Please note that the information included in the sample contract and its exhibits are to be included in the proposal and documents in exhibit "I" filled out, signed, dated, and returned with proposals. Please also note insurance requirements along with need to name additionally insured parties. Specifically identify qualifications, if any, to these documents or specifically state no exceptions – no stated qualifications or exceptions will be interpreted as full acceptance of terms, conditions, etc.;

8. Alternates

Although proposals are requested in strict accordance with the RFP, alternates that enhance the value to the Owner are encouraged and will be considered. Include these as separate line items in addition to the specific pricing requests listed in the Project section.

9. Approved Equal

The Contractor may supply any of the materials specified or offer an equivalent. The Owner will determine whether the material offered is equivalent to that specified. Adequate time shall be allowed for the Owner to make this determination.

The Contractor shall, at its expense, furnish data concerning items offered by it as equivalent to those specified. The Contractor shall have the material tested as required by the Owner to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

Test methods shall be subject to the approval of the Owner. Test results shall be reported promptly to the Owner, who will evaluate the results and determine if the substitute item is equivalent. The Owner's findings shall be final. Installation and use of a substitute item shall not be made until approved by the Owner.

If substitute offered by the Contractor is not found to be equal to the specified material, the Contractor shall furnish and install the specified material.



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The specified Contract completion time shall not be affected by and circumstance developing from the provisions of this subsection.

10. Conflict of Interest

Potential Conflict of Interest - All professional and technical services provided and the resulting deliverables produced by the Contractor shall be free of any conflict of interest. Any person, firm or subsidiary thereof who has provided or is currently providing engineering services to a construction contractor(s) on any project listed in the scope of this RFP may not compete either as a prime contractor for, or participate as a subcontractor on the Agreement resulting from this RFP. Any person or entity with whom the Owner has contracted to prepare or assist in the preparation of this RFP is ineligible to submit a proposal for the provision so specified in this RFP. In addition, if an Agreement is awarded as a result of this RFP, Contractor will be foreclosed from bidding on the construction work of this Project (if applicable).

All professional and technical services provided and the resulting deliverables produced by the Contractor shall be free of any conflict of interest. Advise and disclose any potential conflicts known by your firm and discuss how, if selected, your firm would address any concerns raised by such potential conflict. A potential conflict of interest may include, but is not limited to, work related to this project either in the project area, contracts with counties, cities, developers, current clients, and other parties who may have a financial interest in the outcome of this project. Also reference the section regarding Conflict of Interest and Political Reform Act Obligations of the Owner-Contractor Agreement, Exhibit "I". If none, please provide statement of no known potential conflicts of statement.



4. SAMPLE AGREEMENT

San Marcos Training Tower, 186 Santar Place, San Marcos, CA 92069

Sample Agreement follows this cover page and includes General Terms and Conditions and Exhibits "A" through "J".

CONSTRUCTION SERVICES AGREEMENT

(Short Form / Lump Sum)

Contractor

Company: TBD
Address: _____
City/State/Zip: _____
Representative: _____
Phone: _____ Fax: _____
Email: _____
License No: _____ Expires: _____
Key Personnel: _____

Owner

Company: City of San Marcos
c/o IDS Real Estate Group
Address: 785 J Street
City/State/Zip: San Diego, CA 92101
Representative: Fay Ryan
Phone: 619-961-1981 Fax: 619-515-0103
Email: fryan@idsrealestate.com

Project

Name: San Marcos Training Tower
Address: 186 Santar Place
City/State/Zip: San Marcos, CA 92069
Project No: 593
Contract No: WO-XX-TBD
Contract Date: TBD
Vendor No: TBD

Construction Manager

Company: IDS Real Estate Group
Address: 785 J Street
City/State/Zip: San Diego, CA 92101
Representative: Christopher Maurer
Phone: 619-961-1980 Fax: 619-515-0103
Email: cmaurer@idsrealestate.com

A. Description of Work. The work to be provided by Contractor in connection with the project stated above ("Project") consists of all labor, materials, equipment, services, fees and other work, of any kind, within the Description of Work attached hereto as Exhibit "A" and that is required by the Drawings, Specifications and Reference Documents attached hereto as Exhibit "E", together with any other labor, materials, equipment, services and other work that, although not expressly described therein are nonetheless reasonably inferable as being necessary in order to achieve completion of the Work and delivery of the construction provided for in this Agreement to Owner in a condition that is complete and usable by Owner for its intended purpose (collectively, the "Work").

B. Contract Documents. The Contract Documents consist of this Agreement, its General Terms and Conditions, the Exhibits attached hereto, the Drawings, Specifications, Reference Documents and other documents and things referred to in such Exhibits and all Change Orders hereafter entered into between Owner and Contractor ("Contract Documents").

C. Contract Time: Following a Notice to Proceed by Owner, Contractor shall proceed to prosecute the Work (including, without limitation, the achievement of Substantial Completion and Final Completion) in accordance with the time limits in the construction schedule attached hereto as Exhibit "F" ("Schedule"). Liquidated Damages do apply to this Agreement and are recoverable in the amount of One Thousand Dollars and No Cents (\$1,000.00) per calendar day do not apply to this Agreement.

D. Contract Price: Subject to any express qualifications, exclusions and allowances set forth in Exhibit "A" attached hereto, Contractor shall be paid, in accordance with the payment provisions of the General Terms and Conditions below, a total, lump sum compensation for full and satisfactory performance of the Work of Alphanumeric Dollar Amount TBD (\$TBD) ("Contract Price").

E. Labor: Union Labor Only: Yes No Only Prevailing Wages Required: Yes No

F. Contractor Bonds: Performance and Payment Bonds by Contractor are required are not required.

G. Subcontractor Bonds/SubGuard™: Subcontractor Bonds or SubGuard™ Insurance is not required is required for: All Sub Trades only the following Sub Trades: _____.

H. Pollution Liability: Yes No

I. Exhibits: The following Exhibits are attached hereto and incorporated herein: Exhibit "A" (Description of Work); Exhibit "B" (Insurance and Bonds); Exhibit "C" (Release Forms); Exhibit "D" (Payment Application Form); Exhibit "E" (Drawings, Specifications and Reference Documents); Exhibit "F" (Schedule); Exhibit "G" (Schedule of Values); Exhibit "H" (Prevailing Wage Requirements); Exhibit "I" (Forms and Certifications); Exhibit "J" (Performance and Payment Bonds).

THIS AGREEMENT IS MADE IN ACCORDANCE WITH AND SUBJECT TO THE SPECIFIC TERMS SET FORTH ABOVE AND THE GENERAL TERMS AND CONDITIONS ATTACHED HERETO AND INCORPORATED BY THIS REFERENCE. PLEASE SIGNIFY YOUR ACCEPTANCE BY SIGNING THIS AGREEMENT BELOW.

SIGNATURE BLOCK ON FOLLOWING PAGE

GENERAL TERMS AND CONDITIONS

ARTICLE 1 COMPENSATION AND PAYMENT TO CONTRACTOR

1.1 Contract Price. Contractor's full compensation, for satisfactory performance of the Work in compliance with the Contract Documents, shall be the price set forth on the first page of this Agreement ("Contract Price"). Subject to the Contractor's right to adjustments of the Contract Price by Change Order as provided for elsewhere in this Agreement, the Contract Price shall be deemed to be full compensation for all Work provided by Contractor and is conclusively presumed to cover all foreseen and unforeseen costs, fees, profit, overhead and expenses arising out of or related to Contractor's performance of the Work.

1.2 Adjustments to Contract Price.

1.2.1 Authorization. Owner reserves the right to make changes, additions or deletions to the Work. The Contract Price may only be adjusted for additions or deletions to the Work by either: (1) a written agreement executed by Owner and Contractor ("Change Order"); or (2) a written directive issued and executed by Owner ("Construction Change Directive") directing the performance of a change that is expressly identified in the Construction Change Directive as undisputed and that Owner directs to be performed in advance of complete agreement on the terms for adjustment of the Contract Price or Contract Time on account thereof.

1.2.2 Basis of Adjustment. The Contract Price shall be adjusted (i.e., increased or decreased) for additions or deletions to the Work based on (1) the agreed unit prices, if any, set forth in Exhibit "A", or (2) if there is no such applicable unit price, a lump sum price agreed to by Owner and Contractor, or (3) if there is no such unit price or lump sum price and if Contractor has been authorized by Construction Change Directive to proceed on a time and materials basis, the reasonable savings and/or reasonable additional costs to Contractor. Adjustments to the Contract Price for additions to the Work authorized by Construction Change Directive to be performed on a time and material basis shall be compensated if fully documented by Contractor substantiating, to Owner's satisfaction, the actual time and costs required to perform the extra work; provided, however, that under no circumstances shall Owner be obligated to pay a total amount for such time and materials that exceeds a fair and reasonable value for the extra work performed.

1.2.3 Allowable Markups. Unit prices are deemed to include all markups to Contractor and Subcontractors for overhead and profit. Markups by Contractor and any subcontractor, sub-subcontractor supplier and vendor, of any contracting tier ("Subcontractor") for overhead and profit on extra work authorized by Change Order and performed on a lump sum or time and materials basis shall be limited to (1) a Contractor markup of 5% (whether the Contractor is self-performing or applying a markup to extra work performed by a Subcontractor); (2) a markup not to exceed 15% by the tier of Subcontractor that is performing the extra work; and (3) a markup not exceed 5% by each tier of Subcontractor that is in a tier that is above the tier of the Subcontractor performing the extra work.

1.2.4 Deleted Work/Additional Work. Owner reserves the right to increase or decrease any portion of the work. In the case of deletions to the Work, the adjustment to the Contract Price shall be based on the greater of either (1) the savings to Contractor at the time the deletion was ordered or (2) the amount(or, a proportionate amount) included by Contractor in its original bid for the deleted work. In case of additional Work, the adjustment to the Contract Price shall be based on amount (or, a proportionate amount) included by Contractor in its original bid for the additional work.

1.2.5 Notice of Change. Contractor shall submit written notice to the Owner if, in the Contractor's opinion, it receives additional written or verbal instructions, information or directions that constitute a change, addition, extra work or delay for which Contractor believes it is or may be entitled to an adjustment of the Contract Price or Contract Time. Such notice shall be provided prior to performance of the Work affected by such instruction, information or direction and within three (3) days after Contractor first received such instruction, information or direction and shall describe the instruction, information or direction and its probable impact on the Work, Contract Price and Contract Time. Failure to provide such written notice in the manner required by this Paragraph 1.2.5 shall constitute a waiver by Contractor of the right to any adjustment to the Contract Price or Contract Time by reason of such instruction, information or direction.

1.2.6 Disputed Changes. In the event of a dispute with respect to the Contractor's entitlement to, or the price or value of, work (including, without limitation, extra work or deleted work), Contractor shall nonetheless perform the disputed work as directed in writing by Owner, without delaying, slowing or interrupting the progress of the overall Work, and both Owner and Contractor shall each be deemed to have reserved their rights with respect to any matters in dispute relating thereto. If Owner and Contractor cannot agree to a price, Contractor shall be paid on a time and material basis.

1.2.7 Waiver. Except as otherwise provided in Paragraph 1.2.6, above, Contractor conclusively waives any right to additional compensation for extra work that is either: (1) performed, for any reason, without a written Change Order or Construction Change Directive signed in the manner required by this Section 1.2; or (2) that is performed (whether or not authorized in writing by Owner) as a result of circumstances that are caused by the negligence, willful misconduct or violation of an applicable law by Contractor or a Subcontractor or the Contractor's failure to comply with the Contract Documents.

1.2.8 Allowances. Allowances are limited to those items of Work expressly identified as Allowances in Exhibit "A" attached hereto ("Allowance"). The Contract Price shall be adjusted (i.e., increased or reduced) by Change Order if the actual cost to Contractor for the Work covered by the Allowance is greater or lesser than the amount of the Allowance. For purposes of the preceding calculation, amounts for Contractor's overhead (direct and indirect) and profit shall be deemed part of the Contract Price and not covered or included in the amount of the Allowance.

1.2.8 Value Engineering. Contractor shall, at no additional cost to Owner and without any sharing in cost reductions achieved, submit estimates and make recommendations concerning design and construction procedures to reduce costs. If such recommendations are accepted and implemented and involve a deletion to the Work, then the Contract Price shall be adjusted as provided in Paragraph 1.2.4, above.

1.3 Application for Progress Payment.

1.3.1 Submission. No later than the 25th day of each month, Contractor shall submit to Owner an accurate and complete Application for Payment, using the form attached hereto as Exhibit "D" ("Application for Payment"), signed by Contractor and requesting payment in accordance with the calculation methodology set forth in Section 1.4, below, for Work completed by Contractor during the preceding month.

1.3.2 Schedule of Values. Each Application for Payment shall be accompanied by a breakdown of the Contract Price prepared by Contractor and approved by Owner, in such detail as Owner, in its sole and absolute discretion, may deem necessary ("Schedule of Values"). A copy of the initial Schedule of Values is attached hereto as Exhibit "G". The Schedule of Values, which may be initially based upon Contractor's estimates of Subcontractor costs if actual prices are unavailable, shall be revised by Contractor monthly to reflect the actual Subcontractor prices for the Work as and when they are available.

1.3.3 Lien Releases, Supporting Data. Each Application for Payment shall be accompanied by: (1) conditional waivers and releases of mechanic's lien, stop payment notice and bond rights upon progress payment in the form attached hereto as Exhibit "C", executed by Contractor and by each Subcontractor, of every tier, for whom payment is sought by the Contractor that conditionally waive and release all mechanic's lien, stop payment notice and bond rights for Work performed during the period of time covered by Contractor's current Application for Payment; and (2) unconditional waivers and releases of mechanic's lien, stop payment notice and bond rights upon progress payment in the form attached hereto as Exhibit "C" executed by Contractor and by each Subcontractor, of every tier, that unconditionally waive and release all mechanic's lien, stop payment notice and bond rights for Work performed during the period of time covered by Contractor's Application for Payment immediately preceding the current month's Application for Payment. In addition, each Application for Payment shall be signed and notarized and accompanied by such other information and substantiation as Owner or its lender may in its/their sole and absolute discretion require, including, but not limited to, verification, certification or other information relating to matters involving insurance, title insurance endorsements, construction inspections and satisfaction of conditions relating to retention of or processing of payment by third parties retained to assist in the payment process. Owner shall not be required to process or approve of all or any portion of an Application for Payment until such releases and other information and substantiation is submitted, complete and accurate.

1.4 Progress Payment Amount. Provided Contractor has submitted an Application for Payment in accordance with the requirements of this Agreement, Owner agrees to pay monthly to Contractor an amount equal to the following:

1.4.1 Ninety percent (90%) of the Owner's good faith determination of the value, expressed as a percentage of the Contract Price, of the Work (including, without limitation, Work authorized by Change Order) in permanent place and which Owner judges has been satisfactorily completed in accordance with the Contract Documents;

1.4.2 less amounts previously paid, and

1.4.3 less amounts that Owner is authorized to withhold under the terms of this Agreement.

1.5 Progress Payments by Owner. Provided a correct and accurate Application for Payment with accompanying documentation required by this Agreement is received by Owner no later than the date fixed in Paragraph 1.3.1, above, Owner will, within thirty (30) days after the date of receipt thereof, pay to Contractor such undisputed amount as Owner, in good faith, determines is due in accordance with Section 1.4, above. If such Application for Payment and other

documentation is received by Owner after the date fixed in Paragraph 1.3.1, above, then such period of time for payment by Owner shall be sixty (60) days after receipt thereof.

1.6 Application for Final Payment. Following Final Completion of the Work, Contractor will submit to Owner an Application for Payment requesting Final Payment of any sums not previously approved by Owner for payment to Contractor. The Application for Payment submitted by Contractor for Final Payment shall be accompanied by unconditional releases of mechanic's lien, stop payment notice and bond rights in the form attached hereto as Exhibit "C" executed by Contractor and by each Subcontractor, of every tier, that unconditionally waive and release all mechanic's lien, stop payment notice and bond rights for Work performed at any time for the Project. In addition, such Application for Payment shall be signed and notarized and accompanied by such other information or substantiation as Owner or its lender may in its/their sole discretion require, including, but not limited to, verification, certification or other information relating to matters involving insurance, title insurance endorsements, construction inspections and satisfaction of conditions relating to retention of or processing of payment by third parties retained to assist in the payment process. Owner shall not be required to process or approve of all or any portion of such Application for Payment until such releases and other information and substantiation is submitted, complete and accurate.

1.7 Final Payment. Subject to Owner's right of withholding set forth in Section 1.9, below, payment of all sums retained by Owner ("Final Payment") shall be made to Contractor thirty (30) days following: (1) receipt of an Application for Payment and accompanying documentation required by Section 1.6, above, requesting Final Payment; (2) receipt by Owner of an affidavit signed by Contractor's managing officer that all payrolls, bills for materials and equipment and other indebtedness connected with all Work for which the Owner, Project, Site or holder of funds might in any way be charged or responsible, have been paid in full; (3) Final Completion of all Work (as defined in Section 2.6, below) in accordance with the Contract Documents; (4) receipt by Owner of a written statement by Contractor satisfactory to Owner that the insurance required by this Agreement will remain in effect for, or be renewable to cover, the period required by this Agreement; (5) delivery to Owner of any and all governmental certificates and approvals required for use or occupancy of the Work by Owner; (6) delivery to Owner of any manufacturers' operation and maintenance manuals and guarantees or warranties for materials provided or equipment installed in the Work; (7) delivery to Owner of full, complete and correct set of reproducible "as-built" drawings showing the condition of the Work as installed, including, without limitation, all changes, additions and deletions; and (8) if Performance and Payment Bonds are required to be provided by Contractor, written consent of surety to Final Payment.

1.8 Acceptance of Final Payment. Acceptance of Final Payment by Contractor shall constitute a waiver of all claims by Contractor, except those previously made in writing and identified by Contractor as unsettled in Contractor's Application for Payment requesting Final Payment.

1.9 Withholding by Owner. In addition to the amounts which Owner may retain as provided in Section 1.4, above, Owner may withhold a sufficient amount from any payment or payments otherwise due to Contractor as Owner deems, in its the exercise of its good faith discretion, necessary to protect Owner against actual or threatened loss (including, without limitation, a sum for estimated attorney's fees and court costs) due to any of the following circumstances if and to the extent that such circumstances have not arisen from a breach by Owner of its obligations under this Agreement:

- 1.9.1 defects in the Work not remedied;
- 1.9.2 third-party claims against the Owner, the Site, Owner's lender or the construction fund;
- 1.9.3 failure of Contractor or its Subcontractors, of any tier, to make payments due for Work;
- 1.9.4 a reasonable doubt that the Work can be completed for the balance of the Contract Price then unpaid;
- 1.9.5 damage to the Owner or others for which Contractor is responsible;
- 1.9.6 a reasonable doubt that the Work can be completed within the Contract Time;
- 1.9.7 liquidated or actual damages for delay assessed in accordance with this Agreement; or
- 1.9.8 any other failure of Contractor to perform any of its obligations under the Contract Documents.

1.10 Overpayments. Owner reserves all rights with respect to any sums paid by Owner which were not in fact due at the time of payment, including, without limitation, the right to deduct the amount of such payments from payments due under future Applications for Payment.

1.11 Stored Materials. Payment may be made for materials and equipment stored on or off the Site, at the sole and absolute discretion of Owner. Without limitation to the foregoing such payment will under no circumstances be made unless: (1) the Contractor has obtained insurance coverage for the full insurable value of such materials with Owner named as insured; (2) the Contractor has executed appropriate documents to vest title to such materials and equipment to Owner; and (3) such materials and equipment if stored off-Site are located in a bonded, secure warehouse and have been specified and marked for the Project.

1.12 No Waiver. No payment (including, without limitation, Final Payment), inspection or acceptance of any Work by Owner, Construction Manager or anyone else acting on behalf of Owner and no possession taken by Owner of any portion of the Project shall be deemed to constitute a waiver of any provision of the Contract Documents or any right or remedy of Owner under applicable laws or this Agreement, including, without limitation, any right of Owner to damages or other relief for breach by Contractor of the Contract Documents.

1.13 No Security Interests. Contractor shall not enter into any contract for the supply of materials or services to the Project which purports to grant a security interest or right of repossession to any person or entity respecting the Work or the Site, or any portions thereof or chattels placed thereon.

1.14 Permits, Licenses, Taxes. Unless otherwise expressly provided in Exhibit "A" attached hereto, Contractor shall obtain, pay for and maintain for the duration of its performance of this Agreement, all appropriate permits, licenses, and certificates that may be required in connection with the performance of its obligations hereunder, including, but not limited to, all required construction permits and business licenses. Contractor and its Subcontractors, of every tier, are responsible for paying all sales, consumer, business, and similar taxes for the Work or portions thereof provided by Contractor or its Subcontractors.

1.15 Books and Records. Contractor shall maintain its books and records for the Project in accordance with Generally Accepted Accounting Principles. Owner, Construction Manager, Owner's independent auditors, or a designee of any of them, shall have the right, as frequently as may be reasonably required under the circumstances, to examine and to audit, inspect and copy, within twenty-four (24) hours notice to Contractor, all books, records, documents and such other evidence in the possession or custody of the Contractor or its Subcontractors as may be necessary to verify all amounts charged by Contractor under this Agreement or otherwise claimed to have been incurred by Contractor or its Subcontractors in connection with the performance of this Agreement. Such right of inspection shall be carried out during business hours at Contractor's offices or facilities. Contractor shall, at its own expense, furnish facilities and cooperate fully with the audit. Such right of inspection and copying shall not include the right to inspect or copy estimates that are prepared for Work that Owner has approved to be performed on a lump sum basis unless the lump sum price for such Work is disputed by Owner. Contractor shall retain all books, records and other documents pertaining to the Project for a period of ten (10) years after Final Completion.

1.16 Payments in Trust. Each payment made by Owner to Contractor shall be deemed made to Contractor in trust for the Subcontractors to the extent such Subcontractors have not been paid for the labor, materials, equipment, services or supplies provided by them to Contractor.

1.17 Joint Payments. The Owner shall have the right, if deemed necessary in its sole reasonable discretion and upon prior notice to Contractor, to issue joint checks made payable to the Contractor and any of the Subcontractors, of any tier. Such joint check payees shall be solely responsible for the allocation and disbursement of funds included as part of any such joint payment. Endorsement on such check by a payee shall be conclusively presumed to constitute receipt of payment by such payee. In no event shall any joint check payment be construed to create: (1) any contract between the Owner and any of the Subcontractors, of any tier; (2) any obligation from the Owner to any of the Subcontractors; or (3) any third-party rights against the Owner.

ARTICLE 2 CONTRACT TIME

2.1 Time of Essence. Time is of the essence with respect to all time limits set forth in this Agreement pertaining to the performance of any and all obligations of Contractor.

2.2 Commencement. Contractor shall commence the Work in accordance with requirements of the Notice to Proceed issued by Owner. Unless a later date is stated in the Notice to Proceed, the Contract Time shall commence on the third (3rd) day after receipt by Contractor of the Notice to Proceed, or if no Notice to Proceed is issued by Owner upon actual commencement of Work by Contractor at the Site. Subject to Contractor's compliance with Section 2.5, below, the Contract Time shall be extended, if, due solely to the Owner's failing or refusing after written request by Contractor to issue a Notice to Proceed before the date set forth in the Schedule for commencement of the Work, the Work does not commence on or before the date for commencement included in the Schedule.

2.3 Contract Time.

2.3.1 Contract Time. Contractor shall diligently perform the Work so as to achieve Substantial Completion and Final Completion of the Work, as well as achievement of any other milestones or deadlines set forth in the Schedule, in accordance with the time limits applicable thereto that are set forth in the Schedule ("Contract Time").

2.3.2 Substantial Completion. Substantial Completion is the point when: (1) the entire Work, including all of its parts, is sufficiently complete and approved by governing building officials and governmental authorities so the Work can be fully enjoyed and beneficially occupied and utilized by Owner for its intended purpose, except for minor items which do not impair Owner's ability to so occupy and utilize, or continue to occupy or utilize, the entire Work; (2) government authorities have issued a certificate of occupancy or its equivalent for the Work; and (3) government authorities have accepted all off-Site improvements constructed by Contractor or its Subcontractors as being properly constructed in accordance with the Contract Documents and in accordance with applicable laws and other governmental requirements. Any reference contained in the Schedule to Substantial Completion shall, notwithstanding any statement or description in the Schedule to the contrary, be deemed to mean Substantial Completion as defined in this Paragraph 2.3.2.

2.3.3 Adjustments. The Contract Time may only be adjusted for time extensions approved by Owner and agreed to by Change Order executed by Owner and Contractor.

2.3.4 Calendar Days. All references in the Contract Documents to "days" shall mean calendar days, unless otherwise described as "work" or "business" days.

2.3.5 Punch List. When the Contractor considers that it has achieved Substantial Completion of the Work, or a portion thereof which the Owner elects to accept separately, Contractor shall submit a request to Owner to make an inspection. If the Owner's inspection discloses any item necessary for Substantial Completion that is not in accordance with the requirements of the Contract Documents, Contractor shall, before approval of Substantial Completion by Owner, complete or correct such items. When the Owner determines that the Contractor has achieved Substantial Completion of the Work or such designated portion, the Owner will so notify Contractor along with Owner's determination of the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance. Within five (5) days after receipt of such notice of determination that the Contractor has achieved Substantial Completion, Contractor will prepare a comprehensive list of minor items to be completed or corrected for Final Completion ("Punch List"). Failure to include an item on the Punch List or to identify any item of incomplete or incorrect Work in connection with any inspections by Owner does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. All outstanding Work on the Punch List shall be 100% completed by Contractor as soon as possible following actual Substantial Completion. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work, unless otherwise provided in Contract Documents.

2.4 Liquidated Damages. *The provisions of this Section 2.4 shall apply only if it is stated on the first page of this Agreement that liquidated damages apply to this Agreement.*

2.4.1 OWNER WILL SUFFER SUBSTANTIAL DAMAGES FOR CONTRACTOR'S FAILURE TO ACHIEVE SUBSTANTIAL COMPLETION OF THE WORK WITHIN THE CONTRACT TIME. ALTHOUGH CERTAIN TO OCCUR, SUCH DAMAGES MAY BE EXTREMELY DIFFICULT OR IMPRACTICABLE TO MEASURE. ACCORDINGLY, IT IS AGREED THAT IN THE EVENT SUBSTANTIAL COMPLETION OF THE WORK IS NOT FULLY AND SATISFACTORILY ACHIEVED WITHIN THE CONTRACT TIME FOR SUBSTANTIAL COMPLETION (AS ADJUSTED BY CHANGE ORDER), CONTRACTOR SHALL PAY TO OWNER, OR IF NOT PAID, OWNER SHALL HAVE THE RIGHT, IN ITS SOLE AND ABSOLUTE DISCRETION, TO WITHHOLD FROM FUNDS OTHERWISE DUE TO CONTRACTOR, AS LIQUIDATED DAMAGES AND NOT A PENALTY THE AMOUNT INDICATED ON PAGE 1 OF THIS AGREEMENT FOR EACH DAY AFTER THE CONTRACT TIME FOR SUBSTANTIAL COMPLETION (AS ADJUSTED BY CHANGE ORDER) UNTIL SUBSTANTIAL COMPLETION IS ACHIEVED.

2.4.2 No Limitation. Owner's right to assess liquidated damages shall be in addition to, and not a limitation upon, any other rights Owner may have at law or in equity, arising out of Contractor's breach of any obligation other than the obligation to achieve Substantial Completion of the Work within the Contract Time for Substantial Completion, including, without limitation, any excess costs to re-procure and complete Work not performed by Contractor.

2.5 Extensions. Contractor shall be entitled to extensions of the Contract Time caused solely by unavoidable circumstances beyond the control and foreseeability of Contractor and its Subcontractors, of any tier, and without the contributing breach of contract, negligence, willful misconduct or violation of applicable law by Contractor or its Subcontractors, of any tier. Such delays may include, without limitation, abnormal inclement weather, unavoidable casualties, acts of God, unavoidable industry-wide strikes or industry-wide unavoidable shortages of material. Notwithstanding the

foregoing, however, no such extension shall be allowed unless Contractor has submitted a written request for extension to Owner within five (5) days after Contractor first becomes aware of such circumstances. Contractor's right to an extension of time shall be its sole and exclusive remedy in the event of delay or disruption to its performance of the Work in lieu of any right to additional compensation or damages, of any kind.

2.6 Final Completion. Final Completion is that point at which all requirements and obligations of the Contract Documents have been satisfactorily met and performed, the Work is fully and finally completed in accordance with the Contract Documents, the Work is accepted by Owner, the Contractor has achieved Substantial Completion, the Punch List is completed and all necessary governmental approvals, inspections and certificates relating to the Work and right of occupancy by Owner have been unconditionally issued.

2.7 Construction Schedule. Contractor shall maintain and update the Schedule no less frequently than monthly as the Work progresses. Time limits set forth in the Schedule shall not be changed except for extensions permitted and approved by Owner in accordance with Section 2.5, above. Contractor is solely responsible for suitability and accuracy of the Schedule.

ARTICLE 3 INDEMNIFICATION

3.1 Indemnification. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless Owner, Owner Affiliates, Owner's lender, those persons or entities defined as "Additional Insureds" in Exhibit "B" attached hereto and any person or entity having an ownership or possessory interest in any portion of the Project or the Site (including, without limitation, lessors or tenants), and each of them, and each of their respective members, affiliates, partners, directors, officers, agents, employees, representatives, consultants, contractors, and insurers (collectively, "Indemnitee(s)"), utilizing legal counsel acceptable to Owner, from and against any and all claims, damages, losses and expenses (including, without limitation, all fees and expenses of engineers, architects, attorneys, paralegals, experts and all court, arbitration or other dispute resolution costs), regardless of whether caused in part by the acts or omissions (actively or passively negligent or otherwise) of an Indemnitee, which arise out of or result from any of the following:

3.1.1 any alleged act or omission of Contractor or its Subcontractors, of any tier, or any person or entity to whom any of them may be liable;

3.1.2 the inaccuracy of any representation by Contractor given in accordance with or contained in this Agreement;
or

3.1.3 except as otherwise provided in Section 3.4, below, any failure by Contractor to make payment of amounts claimed due by a Subcontractor, of any tier;

PROVIDED HOWEVER, that nothing herein shall be interpreted as obligating Contractor to indemnify any Indemnitee against the active negligence or willful misconduct of, or defects in design furnished by, such Indemnitee or such Indemnitee's agents, servants, or independent contractors who are directly responsible to such Indemnitee.

3.2 No Limitation. The indemnification obligation under Section 3.1, above, shall not (1) be limited by the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under insurance, workers' compensation acts, disability benefit acts or other employee benefit acts; (2) be interpreted as a limitation on Owner's rights of implied indemnity or contribution.

3.3 Mechanic's Liens, Stop Payment Notices. Subject to Section 3.4, below, Contractor shall, within ten (10) days of demand by Owner: (1) discharge, or cause to be discharged, any and all mechanic's liens, stop payment notices and claims filed against the Owner, the Site, the Owner's lender or the construction fund by Contractor or any Subcontractor, of any tier, relating to the Work, regardless of the apparent or actual validity of the lien, stop payment notice or claim, and (2) immediately reimburse Owner for all expenses, costs and attorney's fees incurred as a result of the filing/recording, negotiation or release of any such mechanic's lien, stop payment notice or claim.

3.4 Breach by Owner. The Contractor's obligations under Section 3.3 and its indemnification obligation under Paragraph 3.1.3, above, shall not apply to any portion of a mechanic's lien, stop payment notice or claim that is asserted as a result of the Owner breaching its payment obligation under this Agreement, but shall apply to any and all other portions thereof.

3.5 Owner Affiliate. The term "Owner Affiliate" as used in this Agreement means: (1) IDS Real Estate Group and its officers, directors, board members, constituent partners, members and employees, (2) any entity (including, without limitation, any company, corporation, LLC, joint venture or partnership) that is directly or indirectly owned, managed or controlled (whether such ownership, management or control is by means of contract, ownership of voting securities or otherwise) by

Owner or IDS Real Estate Group (including, without limitation, non-controlled subsidiaries); (3) any person or entity (including, without limitation, any company, corporation, LLC, joint venture or partnership) that owns, manages or controls (whether such ownership, management or control is by means of contract, ownership of voting securities or otherwise) or has a greater than 10% ownership in Owner or IDS Real Estate Group; or (4) any person or entity (including, without limitation, any company, corporation, LLC, joint venture or partnership) substantially involved in the management of the business affairs of Owner or IDS Real Estate Group.

ARTICLE 4 WARRANTY

4.1 General Warranty. Contractor warrants and agrees that all materials and equipment furnished hereunder as a part of the Work will be new and that all labor, equipment, materials, services and other work furnished as a part of the Work shall be of good quality, executed in a good and workmanlike manner and suitable for its intended purpose and free of defects or deficiencies for a period of one (1) year after the occurrence of actual Final Completion. Contractor further warrants that title to all Work, materials and equipment furnished under this Agreement will pass to Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of any liens, claims, security interests or encumbrances and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the Site or furnishing materials and equipment for the Project, subject to a contract under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person. If required by Owner, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Manufactured items installed in the Work and not specifically covered in this Agreement are to be installed in strict accordance with the manufacturers' current printed instructions. Contractor shall provide for the assignment of all warranties and guarantees from Subcontractor to Owner and shall deliver such warranties and guarantees to Owner as a condition of Final Payment.

4.2 Warranty Repair. Contractor shall repair, replace and correct any portion of the Work found to be not in compliance with the warranty set forth in Section 4.1, above, and shall make good any loss, damage or injury resulting from such noncompliance or resulting from actions required to be taken to repair, replace or correct for such noncompliance, including, without limitation, any loss, damage or injury caused to the Work, to other improvements located on or off the Site or to any persons or personal property.

4.3 Not a Limitation. The Contractor's warranty and the Owner's rights for breach of warranty as set forth above are in addition to, and not a limitation upon, any other warranties or guarantees required or created by the terms of the Contract Documents and are in addition to and not a limitation upon any of Owner's other rights under the Contract Documents or applicable laws.

ARTICLE 5 CONTRACTOR PERFORMANCE

5.1 Contract Documents. Contractor shall perform the Work in full compliance with the Contract Documents. Contractor warrants and represents that it had ample opportunity prior to execution of this Agreement to carefully review the Contract Documents and is satisfied that the Work can be completed within the Contract Price and Contract Time. Contractor agrees that there shall be no adjustment to the Contract Price or Contract Time on account of any errors, omissions, conflicts or ambiguities in the Contract Documents that were either discovered and not reported in writing to Owner prior to execution of this Agreement, or that were discoverable in the exercise of due care by Contractor in its capacity as a contractor and not a design professional but overlooked prior to execution of this Agreement. In the event of any conflict between the provisions of the Contract Documents, the provision imposing the greater obligation and/or liability upon the Contractor, or granting the greater remedy and/or right to Owner, or calling for better quality or larger size or capacity materials, components and/or equipment than required by any laws, codes, regulations or ordinances shall control.

5.2 Applicable Laws. Contractor agrees to, at all times during performance of the Work, conform to and perform the Work in accordance with all applicable requirements of codes, laws, regulations and ordinances (including, without limitation, applicable laws, if any, that may require, notwithstanding the terms of this Agreement, payment of prevailing wages) pertaining to the Work, Project, Owner and Contractor, with no adjustment to the Contract Price or Contract Time.

5.3 Key Personnel. Contractor shall submit to Owner for Owner's approval the names of those persons proposed by Contractor to supervise Contractor's performance of the Work. Each such person must be approved by Owner and upon such approval shall be deemed a key person whose services are of essence to this Agreement. No key person shall, for so long as he/she/they are employed by Contractor, be removed or replaced except with the prior written consent of Owner, which consent may be withheld or granted in Owner's sole and absolute discretion.

5.4 Site Personnel. Contractor shall at all times maintain good discipline and order among its employees and Subcontractors, of every tier. The Owner reserves the right to direct Contractor to bar any person deemed by Owner to be unfit from the Site for the duration of the Project and Contractor shall comply with such order. Contractor shall provide competent, fully qualified personnel to perform the Work, and shall ensure that each such employee and Subcontractor, of every tier, engaged upon the Site arranges the storage of materials and equipment and performance of its Work so as to interfere as little as possible with separate contractors or other persons engaged in work for Owner upon the Site.

5.5 Limitation of Liability. Contractor acknowledges and understands that this Agreement is being executed and managed by Construction Manager as agent of the Owner. Contractor agrees to look solely to Owner as recourse for performance of any obligation (including, without limitation, payment of sums under this Agreement) and agrees that under no circumstances shall Construction Manager have any liability to Contractor, regardless of the cause, reason or circumstance, including, without limitation, any nonpayment of sums due Contractor under this Agreement.

5.6 Means, Methods. Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work.

5.7 Safety. Contractor shall have sole responsibility for safety precautions and programs in the performance of the Work by Contractor and its Subcontractors, of every tier. Contractor shall not maintain, commit, nor permit the maintenance or commission of any nuisance in connection with its performance of the Work. Contractor shall erect and maintain, as required by existing conditions and performance of the Work, adequate safeguards for safety and protection, including providing adequate lighting and ventilation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent property and utilities, including, without limitation, all such safety precautions and procedures required by OSHA and other applicable laws, codes and ordinances. If Contractor is performing Work on a Site on which another general contractor, having general responsibility for safety on the Site, is performing work, then and without limitation to Contractor's responsibility for all matters of safety relating to the performance of the Work covered by this Agreement, Contractor shall additionally comply with the requirements of such general contractor's safety program.

5.8 Cooperation. Contractor agrees to reasonably cooperate with, and coordinate its activities so as to not interfere with the work of, Owner's own forces or other separate contractors retained by Owner and performing work at the Site, so that the Project can be completed in an orderly and timely manner. Except where Owner has negligently directed the actions of the separate contractors, Contractor's sole remedy for loss caused by a separate contractor of Owner is to assert a claim or cause of action directly against the separate contractor and Contractor hereby releases, acquits, holds harmless and forever discharges Owner of and from any and all liability for such loss. Owner's separate contractors are third party beneficiaries of the Contract Documents, but only to the extent of claims and causes of action against Contractor arising out of or resulting from any act or omission of Contractor or the Subcontractors causing loss to such separate contractors. Contractor consents to being sued by separate contractors for losses caused by Contractor or a Subcontractor and hereby waives lack of privity of contract with such separate contractors as a defense to such actions. If Contractor or any Subcontractor causes a loss to a separate contractor, then Contractor will promptly settle the matter directly with the separate contractor and will defend, indemnify and hold Owner and the other Indemnitees harmless from any and all effects of such loss on the terms provided for in [Article 3](#), above.

5.9 Subcontractors. Contractor shall identify to Owner each Subcontractor whose price is reasonably expected to exceed \$100,000 and with respect to each investigate the Subcontractor's business history and financial condition and provide to Owner other information that may be relevant to determining the Subcontractor's fitness to meet its obligations. Contractor shall not enter into a subcontract with any such Subcontractor without first obtaining Owner's approval of the Subcontractor. Without limitation to any other provisions of this Contract, Contractor shall include in all of its subcontracts with its first-tier Subcontractors provisions: (1) requiring Subcontractors to assume toward Contractor the same obligations required by Contractor under the provisions of this Agreement; and (2) assigning the Contractor's rights and interest in and to each Subcontractor's subcontract to Owner contingent only upon written notice by Owner to Subcontractor of its acceptance of such assignment. Contractor shall remain solely responsible for the acts and omissions of its Subcontractors, notwithstanding Owner's review or approval of a Subcontractor or any subcontract entered into between Contractor and a Subcontractor.

5.10 Labor Relations, Prevailing Wages.

5.10.1 Labor Harmony. Contractor is responsible to maintain labor harmony and prevent, avoid and minimize the occurrence of strikes, conflicts, job actions or other disputes that could interfere with the performance of the Work. Contractor shall take all action, including, without limitation, the payment without reimbursement by Owner of all sums required in order to prevent delay to the performance of the Work on account of union strikes, conflicts, job actions or other disputes that have their source in any act or omission of Contractor or its Subcontractors, of any tier.

5.10.2 Union Only Projects. *The provisions of this Paragraph 5.10.2 shall apply only if the Project is stated on the first page of this Agreement to be a "Union Only" Project:* Contractor and all Subcontractors shall (1) be a party to or bound by a collective bargaining agreement applicable to the geographic area in which the Project is located, applicable to the trade or trades in which the Work under the Contract Documents is to be performed, and entered into with one or more labor organizations affiliated with the Building and Construction Trades Council of the AFL-CIO and (2) solely employ members of such labor organizations to perform work within their respective traditional jurisdictions. With the specific, prior written approval of Owner, which may be granted or denied in Owner's sole and absolute discretion, the requirements of the preceding sentence may be changed as follows: (a) a project labor agreement may be substituted in place of a collective bargaining agreement, and (b) an independent, nationally recognized labor organization may be substituted in place of a labor organization affiliated with the Building and Construction Trades Council of the AFL-CIO. Without limiting the preceding provisions of this Paragraph 5.10.2, Contractor shall advise Owner regarding labor issues with trades people and advise and implement an effective labor relations program to achieve labor harmony between and among the trades, avoid jurisdiction disputes and Project specific work actions, and avoid labor related delay specific to the Project. Nothing contained in this Paragraph 5.10.2 is intended to require that the Contractor or a Subcontractor performing work within one trade be a party to or bound by a collective bargaining agreement with respect to one or more other trades in which such person is not performing Work on the Project.

5.10.3 Prevailing Wages Required. *The provisions of this Paragraph 5.10.3 shall apply only if the Project is stated on the first page of this Agreement to be a "Prevailing Wages" Project.* Contractor shall pay only prevailing wages for the performance of the Work and shall submit certified payroll records evidencing payment of prevailing wages with each Application for Payment. Prevailing Wage requirements are set forth in Exhibit "H" (Prevailing Wage Requirements).

5.11 Non-Interference with Operations. Contractor understands and acknowledges that it may be performing the Work in an existing building that shall remain operational and in use by occupants and/or the public during construction. Contractor warrants that it has included in its Contract Price and Contract Time sufficient monies and time to permit the Work to be performed, and agrees to perform the Work, in a manner that will cause minimal interruption, interference or discomfort to tenants by operations, noise, dust or other deleterious effects of construction activities and that will not interfere in any material respect with the Owner's on-going operations, including, without limitation, the use of common areas and parking by occupants, vendors, invitees or the public. Contractor shall assume the risk and responsibility, and shall be liable to Owner, for all losses associated with any failure by Contractor or its Subcontractors to comply with the provisions of this Section 5.11.

5.12 Continuous Performance. Provided that Owner is not in breach of its payment obligation under this Agreement, Contractor shall not stop, slow, interrupt or suspend the Work on account of any disputes or disagreements with Owner, including, without limitation, disputes over payment.

5.13 Owner's Right to Stop Work. If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents or fails to carry out Work in accordance with this Agreement, the Owner, by written notice, may, without prejudice to or limitation upon other remedies the Owner may have, order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; provided, however, that the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. This right shall be in addition to and not in restriction or derogation of the Owner's right to terminate this Agreement in accordance with the provisions of this Agreement.

5.14 Owner's Right to Carry Out the Work. If Contractor fails to carry out the Work in accordance with the Contract Documents, fails to provide sufficient labor, materials, equipment, tools, and services to maintain the progress of the Work, or otherwise fails to comply with any requirement of this Agreement, and fails within seven (7) days, after receipt of notice from the Owner, to promptly commence and thereafter diligently continue to completion the correction of such failure, the Owner may, without prejudice to or limitation upon other remedies the Owner may have, correct such failure at Contractor's expense. In such case, the Owner shall be entitled to deduct from payments then or thereafter due Contractor the cost of correcting such failure, including compensation for the additional services and expenses of the Owner's consultants, design professionals and others made necessary thereby. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall promptly pay the additional amount to the Owner.

5.15 Differing Site Conditions.

5.15.1 Contractor Responsibility. Save and except as provided in this Section 5.15 for Differing Site Conditions, the Contractor agrees to solely bear the risk of loss and delay due to concealed or unknown conditions, surface or subsurface, at the property where the Work is to be performed, including, without limitation, any existing improvements located on such property (collectively, "Site"), without adjustment to the Contract Price or Contract Time.

5.15.2 Contractor Inspection. Contractor warrants and represents that it has fully satisfied itself prior to execution of the Agreement as to the character, quality, and quantities of surface and subsurface materials and obstacles to be

encountered in performing the Work insofar as reasonably ascertainable from a careful inspection of the Site (including, without limitation, existing improvements) and from the geotechnical investigation reports, data and other information concerning the Site (including, without limitation, existing improvements) that have been made available to Contractor by the Owner or that is otherwise obtainable by Contractor in the exercise of care and diligence. Any failure by Contractor to take such information or conditions into consideration will not relieve the Contractor from responsibility for estimating the difficulty and cost of successfully completing the Work within, and without adjustment of, the Contract Price and Contract Time. In addition to the foregoing, Contractor shall verify and measure all field conditions before proceeding with the Work and shall be responsible, without any adjustment to the Contract Price or Contract Time, for costs of replacing or correcting Work and other losses that result due to discrepancies between conditions (including, without limitation, conditions of the ground or in existing improvements) at the Site and design information in the Contract Documents if such discrepancies were either discovered and not reported to Owner prior to performance of the Work affected thereby or were reasonably discoverable by Contractor in the exercise of due care and overlooked by Contractor prior to performance of the Work affected thereby.

5.15.3 Differing Site Conditions. Differing Site Conditions are those conditions, located at the Site (including, without limitation, existing improvements located on the lands of the Site), not otherwise ascertainable by the Contractor through the exercise of thorough care and diligence in its inspection of the Site and Contract Documents, that constitute: (1) subsurface or concealed conditions at the Site (including, without limitation, concealed conditions in existing improvements) which differ materially from those indicated by the Contract Documents; or (3) unknown physical conditions at the Site (including, without limitation, concealed conditions in existing improvements) of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work of the character provided for in the Contract Documents. If the Contractor encounters conditions it believes constitute Differing Site Conditions, then notice of such conditions shall, before such conditions are disturbed, be promptly reported to the Owner within twenty-four (24) hours by a written notice stating a detailed description of the conditions encountered. Owner shall promptly investigate. If Differing Site Conditions are found to exist, then an adjustment shall be made in the Contract Price and Contract Time by Change Order in accordance with Section 1.2, above.

5.16 Violations of Applicable Laws. Contractor shall be responsible, without any adjustment to the Contract Price or Contract Time, for costs of replacing or correcting Work and other losses that result due to Contractor's performing Work that is not in compliance with applicable laws, codes, ordinances or regulations if such non-compliances were either known and not reported to Owner prior to performance of the Work affected thereby or should have been known by Contractor in the exercise of due care and were overlooked prior to performance of the Work affected thereby.

5.17 Royalties and Patents. Contractor shall pay all royalties and license fees required for the performance of the Work. Contractor shall immediately notify Owner if it learns of any circumstances that may constitute an infringement of patent, copyright, trademark or other proprietary rights.

5.18 Inspections. Except as otherwise provided in this Agreement, all inspections required by applicable laws, codes, ordinances or regulations, by this Agreement or by governmental officials, shall be scheduled, arranged, requested, coordinated and supervised by Contractor and paid for by Contractor at its own expense.

5.19 As-Builts. The Contractor shall maintain in good order at the Site one record copy of the drawings, specifications, product data, samples, shop drawings, change orders and other documents depicting the Work, marked currently to record changes made during construction. These documents, and a PDF version, shall be delivered to the Owner upon Final Completion and prior to Final Payment or, if this Agreement is sooner terminated, upon the termination of this Agreement.

5.20 Hazardous Materials

5.20.1 Hazardous Materials. The term "Hazardous Material" as used in this Agreement means any substance: (1) the presence of which requires investigation, remediation, removal or other response under any present or future federal, state or local statute, regulation, rule, guideline, ordinance, code, order, action, policy or common law; or (2) which is or becomes defined as a "hazardous waste", "hazardous substance", "pollutant" or "contaminant" under any present or future federal, state or local statute, regulation, rule, guideline, ordinance, code, order, action, policy or amendments thereto including, without limitation, the Comprehensive Environmental Response Compensation and Liability Act (42 U.S.C. Sections 9601 et seq.) and /or the Resource Conservation and Recovery Act (42 U.S.C. Sections 6901 et seq.); or (3) which is toxic, explosive, corrosive, flammable, infectious, radioactive, carcinogenic, mutagenic, or otherwise hazardous and is or becomes regulated by any governmental authority, agency, department, commission, board, agency or instrumentality of the United States, the State in which the Project is located or any political subdivision thereof; or (4) the presence of which on or in the Site (including, without limitation, existing improvements) causes or threatens to cause a nuisance upon the Site (including, without limitation, existing improvements) or to adjacent properties or poses or threatens to pose a hazard to the health and safety of persons on, in or about the Site (including, without limitation, existing improvements); (5) which contains gasoline, diesel fuel or other petroleum hydrocarbons; (6) which contains polychlorinated biphenyl ("PCB's"), asbestos or urea formaldehyde foam insulation; or (7) which is a threat to human health, safety and/or the environment.

5.20.2 Release by Contractor. Contractor and its Subcontractors shall not cause the discharge, release, emission, spill, storage, treatment or disposal of any Hazardous Material on or adjacent to the Site, except as required and permitted by the Contract Documents and applicable laws in connection with Contractor's and Subcontractors' performance of an obligation to remove Hazardous Materials as part of the Work agreed to be performed under the Contract Documents or as otherwise required under the provisions of this Paragraph 5.20.2. Should Contractor or its Subcontractors discharge, release, emit, spill, treat, store or dispose of any Hazardous Materials on the Site in violation of the foregoing obligation or otherwise in violation of applicable laws, Contractor shall at its own expense and without limitation to Owner's other rights or remedies for default immediately (1) inform Owner in writing of such event, (2) advise Owner with respect to any release reporting or notification requirement that may apply as a result of such event, (3) assist Owner in complying with any such reporting or notification requirement as determined by Owner, and (4) perform any investigation, remediation, removal or other response that is necessary or desirable in order to abate or clean up the condition resulting from such event to the full satisfaction of Owner and any applicable governmental authority. Such Hazardous Materials shall be removed and properly disposed of as soon as they can be accepted at an appropriate disposal facility, and in no event later than sixty (60) days after such waste is generated, unless a longer time is approved by Owner.

5.20.3 Existing Hazardous Materials. In the event Contractor or its Subcontractors encounter materials existing or otherwise present at the Site that are reasonably believed to be Hazardous Materials that have not been rendered harmless, Contractor and Subcontractors shall, except in cases where the removal, encapsulation or abatement of such Hazardous Materials is indicated by the Contract Documents to be part of the Work to be performed under this Agreement, immediately stop Work in the area affected and report the condition to Owner in writing. Contractor shall continue Work in unaffected areas reasonably believed safe. Owner shall then promptly arrange for the sampling, testing and profiling of such suspected Hazardous Materials to confirm the nature, quantity or concentration thereof. In the event that such suspected Hazardous Materials are determined not to be Hazardous Materials or to be Hazardous Materials but not of sufficient nature, quantity or concentration to trigger handling and manifesting of the same as a hazardous waste upon disturbance and removal, then Contractor and its Subcontractors shall, without any adjustment to the Contract Price or Contract Time, be obligated to resume the portion of the Work that was suspended and shall proceed to handle and dispose of such materials pursuant to the Contract Documents, taking all reasonable precautions that are applicable under the circumstances. If, however, the suspected Hazardous Materials are determined to be Hazardous Materials of sufficient nature, quantity or concentration to trigger handling and manifesting of the same as hazardous waste upon disturbance and removal, the parties shall determine what, if any, action to take with respect to such Hazardous Materials, whether to resume Work with respect to such Hazardous Materials, taking all reasonable precautions, and what, if any, adjustment to Contract Price or Contract Time is appropriate and mutually agreed in order to account for any increased cost of handling or disposal of Hazardous Materials not already contemplated and provided for in the Contract Documents.

5.20.4 Remediation by Contractor. *The provisions of this Paragraph 5.20.4 shall apply only if Contractor is required to remediate Hazardous Materials, whether by removal, abatement, encapsulation or otherwise, as part of the Work called for by the Contract Documents.*

.1 Before Contractor or any of its Subcontractors moves, removes, or transports Hazardous Materials, Contractor shall cause such party to provide to Owner the following: (1) verification of its licensed status to haul such materials; (2) verification of the facility's or facilities' licensed status, including a current permit to receive the specific materials to be transported there; (3) certification that the facility is or facilities are not under enforcement action by the U.S. Environmental Protection Agency ("EPA") or State or listed on any applicable EPA or State list of violating facilities; (4) verification of the disposal facility or facilities' EPA Identification Number (if applicable); and (5) original executed letter(s) of indemnity from the disposal facility or facilities' letterhead(s). Contractor further warrants that the selected disposal facility or facilities is or are appropriately licensed and permitted to store, treat and dispose of Hazardous Materials waste in connection with the Work.

.2 Contractor warrants that it is aware of and understands the hazards which are presented to persons, property and the environment in performance of transportation, storage and disposal services as described in the Contract Documents. Contractor and its Subcontractors and agents shall be responsible for (1) processing the application for, and receiving on behalf of the property owner or appropriate entity an EPA or state-equivalent generator identification number (if required); (2) preparing manifests and other shipping documents; (3) making all necessary arrangements (after consultation with Owner) for any off-Site transportation, treatment, storage and disposal of such waste in accordance with applicable laws; (4) ensuring the proper and lawful transportation and disposal of such waste, even if such services are performed by other entities under contract with Contractor or its Subcontractors; and (5) taking any necessary actions to ensure such proper transport and disposal of waste in the event of any contingency, such as the rejection of the waste as nonconforming by any waste disposal facility. Contractor shall promptly provide to Owner copies of all manifests and other shipping documents confirming the receipt and proper disposal of all waste at the disposal facility, even if such services are performed by other entities under contract with Contractor or its Subcontractors.

.3 Contractor shall comply with any Hazardous Materials release reporting requirements to government authorities directly applicable to Contractor. Notice of such reporting must be provided in advance to Owner or concurrently in the event of an emergency.

.4 Contractor and its Subcontractors shall retain all media samples for the longer of (1) the longest holding period specified in any federal, state or local laboratory analytical procedures or guidance for the analyses performed; or (2) three months for soil samples and thirty (30) days for water samples. Further storage or transfer of samples will be made at Owner's expense upon Owner's written request of Contractor. Contractor shall require by contract that each and every Subcontractor and agent of Contractor who performs testing of samples in connection with the Work properly disposes of such samples in accordance with applicable laws after completion of testing and notice to Owner. Regarding any such samples which may remain on-Site, providing Owner has approved of such on-Site storage in advance, Owner agrees to pay all costs associated with the storage, transport, and disposal of such samples.

.5 Upon Final Completion of the Work, Contractor shall confirm to Owner in writing that: (1) all Hazardous Materials specified for removal in the Contract Documents have been removed; and (2) all Hazardous Materials wastes removed from the Site as part of the Work have been disposed of in accordance with applicable laws in a facility or facilities lawfully permitted to accept such wastes for disposal.

ARTICLE 6 INSURANCE, BONDS

Contractor and Subcontractors, of every tier, shall comply with all of the requirements pertaining to insurance and bonds that are set forth in Exhibit "B" attached hereto.

ARTICLE 7 CONTRACTOR DEFAULT, TERMINATION

7.1 Opportunity to Cure Default. Contractor shall cure any default in performance of its obligations under this Agreement within two (2) days after receipt of written notice from Owner; provided, however, that if the breach cannot be reasonably cured within such time then Contractor will commence to cure the breach within two (2) days and will diligently and continuously prosecute such cure to completion within a reasonable time, which shall in no event be later than ten (10) days after receipt of such written notice. Nothing herein shall be interpreted as obligating Owner to give opportunity to cure in the case of an emergency or if the default is of the type that Owner determines, in good faith, cannot be cured, or cannot be fully cured within the time periods set forth in this Section 7.1.

7.2 Remedies Upon Default. In the event of any default by Contractor, including, without limitation, a default that Contractor fails to cure within the time periods set forth above, then Owner may pursue any remedies available under law or equity, including without limitation the following:

7.2.1 Delete Work. Owner may, without terminating this Agreement, delete certain portions of the Work, reserving to itself all rights to losses or damages related thereto.

7.2.2 Perform Work. Owner may, without terminating this Agreement, and as to all or a portion of the Work, terminate Contractor's employment, discontinue the Contractor's performance and/or take over and arrange for performance of the Work by others and charge, or withhold from sums due to Contractor, all costs, losses and damages related thereto.

7.2.3 Terminate. Owner may terminate this Agreement upon written notice, reserving to itself all rights to losses and damages related thereto.

7.3 Rights Cumulative. All of Owner's rights and remedies under this Agreement are cumulative, and shall be in addition to those rights and remedies available in law or in equity. No termination or other action taken by Owner after termination shall prejudice any other rights or remedies of Owner provided by law or equity or by this Agreement and Owner may proceed against Contractor to recover all losses and damages suffered by Owner.

7.4 Disability, Insolvency. In addition to the other rights granted to Owner under this Agreement or applicable law, Owner shall have the right to terminate this Agreement by giving seven (7) days written notice to Contractor, if Contractor is an individual and should die or be adjudged incompetent, or if Contractor attempts to assign this Agreement, or if a petition of bankruptcy is filed by or against Contractor, or if Contractor should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of Contractor's insolvency

7.5 Withholding of Payment. In the event Owner exercises any of its rights as provided in Sections 7.1 through 7.4, above, Owner shall have the right, without releasing Contractor from liability for failure to fulfill this Agreement, to proceed to

complete the Work by any means that Owner determines is expedient and to withhold all or a portion of the monies owing or retained on account of the portion of Work that has been terminated, discontinued or taken over by Owner until Final Completion of the overall Work by Owner, Contractor's surety or other separate contractors retained by Owner. If any loss to Owner arising out of a Contractor default or Owner's exercise of its remedies exceeds the amount withheld, Contractor shall be liable to Owner for the difference and shall promptly remit same to Owner.

7.6 Termination Without Cause. Owner shall have the right, in its sole and absolute discretion and without cause, to terminate this Agreement or any portion of Contractor's performance of the Work, for its convenience, by giving three (3) days' written notice to Contractor. Within forty-five (45) days following such termination and receipt by Owner of an Application for Payment prepared in accordance with Section 7.8, below, Owner shall pay to Contractor, and Contractor agrees to accept, as its sole and exclusive compensation, such sums as allowed under Section 7.8, below.

7.7 Contractor Obligations. Upon receipt from Owner of notice of termination, with or without the occurrence of a default by Contractor, Contractor shall, unless the notice directs otherwise, do the following:

7.7.1 immediately discontinue the Work to the extent specified in the notice;

7.7.2 place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work that is not discontinued;

7.7.3 provide to Owner a description, in writing, no later than seven (7) days after receipt of the notice of termination, of all subcontracts, purchase orders and contracts that are outstanding, including, without limitation, the terms of the original price, payments, balance owing, the status of the Work performed and any outstanding withholding of funds or default, and a copy of the subcontract, purchase order or contract and any written changes, amendments or modifications thereto, together with such other information as Owner may determine necessary in order to decide whether it is in Owner's best interests to accept assignment of, or request Contractor to terminate, the subcontract, purchase order or contract; and

7.7.4 thereafter do only such Work as may be necessary (1) to complete the portion of the Work not discontinued and (2) to preserve and protect Work already in progress and to protect materials, plants, and equipment on the Site or in transit thereto.

7.8 Payment to Contractor. Following exercise by Owner of its rights under this Article 7, with or without the occurrence of a default by Contractor, to terminate this Agreement or to terminate or discontinue (with or without taking over) all or a portion of the Work, Contractor shall submit an Application for Payment to Owner for the portion of the Work terminated or discontinued. Such Application for Payment and Owner's obligation for payment with respect to the terminated or discontinued portion of the Work shall be limited to the portion of the Contract Price that Owner determines, in good faith, is allocable to the percentage of Contractor's completion of that portion of the Work that was terminated or discontinued and that was properly performed by Contractor as of the date of termination or discontinuance, less sums previously paid to Contractor and less any damages or losses experienced by Owner as a result of the negligence, willful misconduct or violation of applicable law by Contractor or a Subcontractor or the Contractor's failure to comply with the Contract Documents. Contractor agrees to accept such compensation as its sole and exclusive right, remedy and recourse in lieu of any additional compensation or damages for, among other things, lost profits, loss business opportunities, loss of bonding capacity or other prospective or consequential damages.

ARTICLE 8 CONTRACTOR'S RIGHTS AND REMEDIES FOR DEFAULT

8.1 Contractor's Remedies. If Owner fails within the applicable time period provided for in Section 1.5, above, to make payment of sums that are not in good faith disputed by Owner and fails to cure such failure within fifteen (15) days after receipt of written notice from Contractor, then, upon an additional ten (10) days' written notice to Owner of intent to terminate, Contractor may terminate this Agreement. The foregoing constitutes the Contractor's sole and exclusive right to terminate this Agreement.

8.2 Payment to Contractor. In the event of termination for cause by Contractor due a default by Owner as provided for in Section 8.1, above, or in the event of a termination by Owner for cause that is determined to be wrongful, Owner's sole obligation shall be to pay Contractor the sums provided for in Section 7.8, above.

**ARTICLE 9
DISPUTE RESOLUTION**

EFFECTIVE FOR CONTRACTS ENTERED INTO ON OR AFTER JANUARY 1, 2017, a claim resolution process shall be made pursuant to California Public Contract Code (“PCC”) section 9204, and shall be applicable to any claim made by a contractor in connection with a public works project.

(1) Claim

(a) Definition. For purposes of this Section, the term “Claim” shall have the same meaning as that term is defined under PCC section 9204, and which may be amended from time to time. Claim shall mean a separate demand by a Contractor sent by registered mail or certified mail with return receipt request, for one or more of the following:

- (i) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by Owner under a contract for a public works project;
- (ii) Payment by Owner of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; and/or
- (iii) Payment of an amount that is disputed by Owner.

(b) Supporting Documentation. The claimant shall furnish reasonable documentation to Owner to support the Claim.

(c) Claim on Behalf of Subcontractor. If a subcontractor or a lower tier subcontractor lacks legal standing to assert a Claim against Owner because privity of contract does not exist, the contractor may present to Owner a Claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the Contractor present a Claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the Claim be presented to Owner shall furnish reasonable documentation to support the Claim. Within forty-five (45) days of receipt of this written request, the Contractor shall notify the subcontractor in writing as to whether the Contractor presented the Claim to Owner. If the Contractor did not present the Claim to Owner, the Contractor shall provide the subcontractor with a statement of the reasons for not having done so.

(2) Owner Review of Claim

(a) Review Period. Following receipt of a Claim, Owner shall conduct a reasonable review of the Claim within forty-five (45) days, unless the Parties mutually agree to extend the Review Period (“Review Period”).

(b) Statement of Review. During the Review Period, Owner shall provide the claimant with a written statement of review identifying the disputed and undisputed portions of the Claim, if any (“Statement of Review”). If Owner needs approval from the City Council to provide the Statement of Review, and the City Council does not meet within the Review Period, Owner shall have up to three (3) days following the next duly-noticed meeting of the City Council that is held after the expiration of the Review Period, to provide the claimant with the Statement of Review.

(c) Payment on Undisputed Portions of Claim. Any payment due to claimant on any undisputed portion of the Claim shall be processed and made by Owner within sixty (60) days following the issuance of the Statement of Review.

(3) Meet and Confer Conference

(a) Demand. If the claimant disputes the Owner’s Statement of Review, or if Owner fails to respond to a Claim issued pursuant to this Section within the Review Period, the claimant may demand in writing an

informal conference to meet and confer for settlement of the issues in dispute (“Meet and Confer Demand”), sent by registered mail or certified mail, return receipt requested.

(b) Conference. Owner shall schedule a meet and confer conference for settlement of the dispute within thirty (30) days following receipt of the Meet and Confer Demand (“Meet and Confer Conference”).

(c) Subsequent Statement of Review. Within ten (10) business days following the conclusion of the Meet and Confer Conference, if the Claim or any portion of the Claim remains in dispute, Owner shall provide the claimant with a subsequent Statement of Review identifying the disputed and undisputed portions of the Claim (“Subsequent Statement of Review”).

(d) Payment on Undisputed Portions of Claim. Any payment due to claimant on any undisputed portion of the Claim shall be processed and made by Owner within sixty (60) days following the issuance of the Subsequent Statement of Review.

(4) Nonbinding Mediation

(a) Definition of Mediation. For purposes of this Section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the Parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Section.

(b) Selection of Mediator, Costs of Mediation. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with Owner and the claimant sharing the associated costs equally. Owner and the claimant shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing. If the Parties cannot agree upon a mediator, each Party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each Party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

(c) Mediation After Commencement of Litigation. Unless otherwise agreed to by Owner and the Contractor in writing, any mediation conducted pursuant to this Section shall excuse any further obligation under PCC section 20104.4 to mediate after litigation has commenced, if/when applicable.

(d) Unsuccessful Mediation. If mediation is unsuccessful, the portions of the Claim remaining in dispute shall be subject to applicable procedures outside this Section.

(e) Arbitration. Owner is not precluded from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this Section does not resolve the Parties’ dispute.

(5) Payments. Amounts not paid in a timely manner as required by this Section shall bear interest at a rate of seven percent (7%) per annum.

(6) Rejection of Claim. If Owner fails to issue a Statement of Review or a Subsequent Statement of Review to the claimant, or to otherwise meet the time requirements of this Section, the following paragraph shall apply.

“Failure by Owner to respond to a Claim from a Contractor within the time periods described in this Section, or to otherwise meet the time requirements of this Section shall result in the Claim being deemed rejected by Owner in its entirety. A Claim that is denied by reason of Owner’s failure to have responded to the Claim, or its failure to otherwise meet the time requirements of this Section, shall not constitute an adverse finding with regard to the merits of the Claim and/or the responsibility or qualifications of the claimant.”

(7) Effective Date. This Section shall remain in effect until January 1, 2020, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2020, deletes or extends that date.

**ARTICLE 10
MISCELLANEOUS**

10.1 Governing Law. This Agreement shall, without regard to the principles of conflicts of laws, be construed and enforced in accordance with and governed by the laws of the State in which the Project is located.

10.2 Complete Agreement. This Agreement represents the full and complete understanding of every kind of nature between the parties with respect to the matters set forth in this Agreement, and all preliminary negotiations and prior representations, proposals and contracts, of whatever kind or nature, are merged herein and superseded hereby. No verbal agreement or implied covenant shall be held to vary the provisions of this Agreement. Any modification of this Agreement will be effective only upon a writing signed by both Owner and Contractor.

10.3 Assignment. Owner is entering into this Agreement based upon Contractor's representations of its experience and qualifications. Accordingly, Contractor shall not assign, hypothecate, or transfer this Agreement, any interest therein, or any money due on claims hereunder, directly or indirectly, by operation of law or otherwise, without the prior written consent of Owner, which consent may be granted or withheld in the sole and absolute discretion of Owner. Any such assignment, hypothecation or transfer without said consent shall be null and void. Owner shall have the right, exercised in its sole and absolute discretion, to assign or transfer, in whole or in part, its rights, title and interest in, and any claims under, this Agreement upon written notice to Contractor.

10.4 Relationship of Parties. Contractor is an independent contractor in respect to all aspects of its performance under this Agreement. Nothing in this Agreement shall be interpreted as creating any joint venture, partnership, joint tenancy, agency or other similar legal relationship between Owner and Contractor, or as creating any contractual obligation, whether direct, indirect or third party beneficiary, on the part of Owner to any Subcontractor, of any tier.

10.5 Waiver. A waiver by Owner of any breach of any term, covenant, or condition contained in this Agreement shall not be deemed to be a waiver of any subsequent breach of the same or any other term, covenant, or condition contained in this Agreement, whether of the same or a different character. No payment by Owner, nor any failure or forbearance by Owner to terminate this Agreement or exercise any other right of remedy upon the occurrence of any breach, violation of default hereof by Contractor shall constitute a waiver by Owner of such breach, violation or default on that occasion or upon the future occurrence of a similar breach, violation or default.

10.6 Survival. The provisions of this Agreement which by their nature survive or involve performance of an act or obligation after termination of this Agreement or Final Completion, including, without limitation, all obligations related to warranties, indemnification, insurance, confidentiality, records retention, audit, dispute resolution and correction of Work not in compliance with the Contract Documents, shall remain in full force and effect after Final Completion or termination of this Agreement.

10.7 Severability. In the event a provision, or portion of a provision, of this Agreement is held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions or portions shall not be affected and shall be enforceable to the fullest extent allowable by law in order to give maximum legal force and effect to those provisions or portions that are not illegal or unenforceable.

10.8 Interpretation. Contractor and Owner acknowledge that the terms of this Agreement have been mutually negotiated and, accordingly, shall not be interpreted against either Owner or Contractor on the basis that either party was solely responsible for or in control of the drafting of this Agreement.

10.9 No Third Party Rights. This Agreement is not intended to confer, and shall not be construed to create or confer, any rights or benefits to parties other than Owner and Contractor.

10.10 Lender Requirements. The Contractor agrees to fully and reasonably cooperate with the Owner in complying with the provisions, requirements and conditions of loan agreements between Owner and its lenders for the Project (including, without limitation, any and all information, reports and certificates which are required by Owner's lenders) and to subordinate the rights of Contractor and its Subcontractors, of every tier, to the security interests of such lenders on such terms as required by such lenders.

10.11 Confidentiality. Contractor agrees that all documents, drawings, reports and other data and information prepared or obtained by Contractor or its Subcontractors, of any tier, in connection with the performance of this Agreement, including, without limitation, all document drafts and work product in progress, are confidential and shall not be disclosed or made available to any individual or entity other than Owner, its designated agents or employees and any person whose services are necessary in order for Contractor to perform this Agreement, except with the prior written approval of Owner, which may be withheld in its sole and absolute discretion, or as otherwise required by law.

10.12 Advertising. Contractor may not use Owner's name or refer to Owner or the Project, directly or indirectly in any promotional materials, advertisement, news release or release to any professional or trade publication without Owner's prior written approval, which may be withheld in its sole and absolute discretion.

10.13 Notices. All notices provided for herein may be transmitted by personal delivery, facsimile, mailed regular or registered or certified mail, return receipt requested, or by overnight express delivery. In all cases, notice shall be considered complete upon actual receipt. Notwithstanding the date of actual receipt, if mailed, notice shall be considered delivered five (5) days after being deposited for mailing. The addresses to be used in connection with such correspondence and notices are as set forth on the first page of this Agreement, or such other address as a party shall from time to time direct in writing. Notices or correspondence to Owner shall be sent to such address marked for the attention of the Owner's Representative, with a copy to Construction Manager.

10.14 Execution, Counterparts. This Agreement may be executed in counterpart by means of signature and initials of a party hereto on a facsimile copy, with the same binding effect as if this original agreement were executed at the same time by all parties.

10.15 Mandated Provisions. Any provision (including, without limitation, any time period or forms of documents) mandated by applicable laws to be included in this Agreement and that is omitted from this Agreement shall be deemed inserted and any conflict between such mandated provision and a contractual provision of this Agreement shall be interpreted, applied and deemed modified so as to make this Agreement comply with applicable laws while also preserving as much as possible the original intent of the contractual provision.

10.16 Proscribed Conduct. As a material inducement to Owner entering into this Agreement and making payment hereunder, Contractor hereby certifies, warrants, and represents, and shall be deemed as part of each Application for Payment to have certified, warranted, and represented for the purpose of inducing Owner to make payment upon such Application for Payment, as follows: (1) neither Contractor nor any director, officer, agent, employee, or representative of Contractor or any Contractor Affiliate has paid, or agreed to pay, nor will any of them pay, any money, fee, commission, credit, gift, gratuity, thing of value, or consideration of any kind, directly or indirectly, to any director, officer, agent, employee, or representative of Owner or any Owner Affiliate in connection with this Agreement or any Work for the purpose of obtaining or rewarding favorable treatment in connection the negotiation or execution of this Agreement (including, without limitation, any modification to this Agreement or any Change Order) or in connection with the Owner's review, inspection, certification, approval, or acceptance of, or payment for, any portion of the Work; (2) neither Contractor nor any director, officer, agent, employee, or representative of Contractor or any Contractor Affiliate has received, or agreed to accept, nor will any of them accept, any money, fee, commission, credit, gift, gratuity, thing of value, or consideration of any kind, directly or indirectly, from any third party for the purpose of providing favorable treatment to such third party in connection the negotiation or execution of a contract, agreement, subcontract, or purchase order (including, without limitation, any modification to such agreement or change order) for the furnishing of any portion of the Work by such third party or in connection with the Contractor's review, inspection, certification, approval, or acceptance of, or payment for, any portion of the Work furnished by such third party; (3) Contractor has not entered, and shall not enter, into any contract, agreement, subcontract, purchase order or other arrangement for the furnishing of any portion of the Work by a Contractor Affiliate, unless approved in writing by the Owner after full disclosure in writing by the Contractor to the Owner of such affiliation or relationship and all details relating to the proposed arrangement. The term "Contractor Affiliate" means any entity related to or affiliated with the Contractor or with respect to which the Contractor has direct or indirect ownership or control, including, without limitation, any entity owned in whole or part by the Contractor; any holder of more than 10% of the issued and outstanding shares of, or the holder of any interest in, the Contractor; or any entity in which any officer, director, employee, partner or shareholder (or member of the family of any of the foregoing persons) of the Contractor or any entity owned by the Contractor has a direct or indirect interest which interest includes, but is not limited to, that of a partner, employee, agent or shareholder.

END OF GENERAL TERMS AND CONDITIONS

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EXHIBIT "A"
DESCRIPTION OF WORK

Page 1 of 2

The Scope of Work shall include, but not be limited to, the following:

- CMU repairs, painting, and installation of a burn room protective barrier located at the San Marcos Training Tower, 186 Santar Place, San Marcos, CA 92069;
- Work as described in Exhibit "E" documents;
- Proposal form in Exhibit "E" and Forms and Certifications in Exhibit "I" are to be filled out by Proposer in their entirety, signed, dated, and returned along with other information requested in the Request for Proposal (e.g., RFP Section 3);
- Alternate price # 1: clean out all grout joints and regROUT at CMU not specifically shown on Exhibit "E" documents. Work under this alternate must be performed within same two (2) week window as base scope – ref. Exhibit "F";
- Alternate price # 2: clean, prepare, and repaint all exterior exposed steel not specifically shown on Exhibit "E" documents. Work under this alternate must be performed within same two (2) week window as base scope – ref. Exhibit "F";
- Preparation of traffic control plans for any impacts caused by the Work, obtaining public works permit(s), and implementing said traffic control plans as needed to prosecute the Work;
- Protection of all finishes that remain and for restoration of said finishes to a condition equal to or better than they were found at the start of Work;
- All temporary barricades surrounding work areas and all staging areas;
- Use of designated parking spots & any staging areas to allow all tenants, their vendors, their visitors, etc. to go about their normal business uninterrupted away from areas of construction;
- Cordoning, blocking-off, directing traffic, and/or otherwise delineating non-construction personnel and vehicles safely away from areas of construction. Fire access, fire lanes, accessible parking, and accessible paths of travel shall be maintained throughout prosecution of the Work, whether permanent or temporary. Contractor shall designate such areas, paths, lanes, etc. and delineate and direct traffic accordingly;
- Surrounding any storm drains within the flow of Contractor's Work areas with storm water pollution prevention devices per best management practices acceptable to local jurisdiction(s). Containment vessels shall be provided to contain any spills from Contractor's tanks, vats, mixers, trailers, stored materials, etc. Protective measures shall remain in place for duration of project or until storm drains are no longer affected by construction;
- All temporary utilities (e.g., construction water & power) and facilities (e.g., portable restrooms, hand washing stations, etc.) needed for the Work. Contractor is responsible for regular, ongoing maintenance of temporary utilities and facilities;
- Preparation of project schedule using Microsoft Project or similar and providing updates on a weekly or as needed basis;
- Preparation of separate graphical schedules showing areas of work & affected dates and providing updates on a weekly or as needed basis;
- Other:
 - The Contractor may supply any of the materials specified or offer an equivalent. The Owner will determine whether the material offered is equivalent to that specified. Adequate time shall be allowed for the Owner to make this determination.
 - The Contractor shall, at its expense, furnish data concerning items offered by it as equivalent to those specified. The Contractor shall have the material tested as required by the Owner to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

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EXHIBIT "A"
DESCRIPTION OF WORK
Page 2 of 2

Test methods shall be subject to the approval of the Owner. Test results shall be reported promptly to the Owner, who will evaluate the results and determine if the substitute item is equivalent. The Owner's findings shall be final. Installation and use of a substitute item shall not be made until approved by the Owner.

If substitute offered by the Contractor is not found to be equal to the specified material, the Contractor shall furnish and install the specified material.

The specified Contract completion time shall not be affected by and circumstance developing from the provisions of this subsection.

WO-XX-TBD

EXHIBIT "B"

INSURANCE AND BONDS

(Construction and Design-Build)

I.
**CONTRACTOR'S
INSURANCE**

A. Basic Coverages. Prior to commencement of the Work and for the duration of Contractor's performance of the Work and such additional periods of time as required elsewhere herein, the Contractor shall, at its own expense, purchase from and maintain with a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, the following insurance coverages as will protect it from claims that may arise out of or result from the Contractor's operations in connection with the Project, whether such operations be by itself, by any Subcontractor, sub-subcontractor, supplier, of any tier, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. **Workers' Compensation Insurance** insuring full liability under the Workers' Compensation and Occupational Disease Laws of the State where the Work is performed;

2. **Employer's Liability Insurance** with minimum limits of liability of \$1,000,000 bodily injury by accident (each accident), \$1,000,000 bodily injury by disease (each employee), and \$1,000,000 bodily injury by disease (policy limit);

3. **Commercial General Liability Insurance** on a form at least as broad as Insurance Services Office ("ISO") Commercial General Liability Coverage "occurrence" form CG 00 01 (or another ISO Commercial General Liability "occurrence" form acceptable to the Owner) with the Broad Form Comprehensive General Liability Endorsement GLO404 (with no Property Damage Liability exclusions pertaining to loss by explosion, collapse or underground damage) that includes, without limitation, bodily injury, sickness, disease or death of any person, injury to or destruction of tangible property (including loss of use resulting therefrom), blanket contractual liability coverage (including, without limitation, coverage for the Contractor's indemnification obligations under the Agreement), protective liability for Contractor's liability arising out of Work performed by Subcontractors, sub-subcontractors, and suppliers, personal and advertising injury liability coverage, products-completed operations liability coverage for a period equal to the longer of (a) two (2) years following date of Final Completion and acceptance of the Work by the Owner or (b) expiration of the applicable statute of limitations for patent and latent construction defect claims, an endorsement amending the aggregate limits to apply on a per location or per project basis, and limits of liability not less than the following:

- a. \$2,000,000 per occurrence/\$2,000,000 in the general aggregate;
- b. \$2,000,000 products/completed operations aggregate;
- c. \$1,000,000 for personal and advertising injury;
- d. \$100,000 for fire damage (any one fire); and
- e. \$10,000 medical expense (any one person);

4. **Motor Vehicle Insurance** issued on ISO Business Auto Coverage form acceptable to Owner, including Symbol 1, insuring for claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of all motor vehicles (including all owned, hired and non-owned vehicles) and having limits of liability of not less than \$1,000,000 for each occurrence combined single limit for bodily injury/property damage;

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EXHIBIT "B"

INSURANCE AND BONDS

(Construction and Design-Build)

5. Property Insurance covering property in transit and stored off-Site and Contractor's tools and equipment (including, without limitation, coverage for flood and earthquake) with limits of liability adequate to cover the full value of such property, tools and equipment; and

6. "Umbrella" Excess Liability Insurance covering losses in excess of Commercial General Liability, Employer's Liability, and Motor Vehicle Insurance as set forth above, for bodily injury or death and property damage (including, without limitation, loss of use therefrom) and broad form contractual liability coverage, with excess limits of liability not less than \$5,000,000 per occurrence and general aggregate.

B. Pollution Liability Coverage. If either of the following conditions exist, then Contractor shall provide insurance covering pollution liability in accordance with the terms of this Paragraph B and the other requirements of this exhibit generally applicable to insurance required to be provided by Contractor: (1) Contractor is required as part of the Work to remediate Hazardous Materials, whether by removal, abatement, encapsulation or otherwise, or (2) Contractor is required to perform the Work in an area, or adjacent to an area, that contains known Hazardous Materials and the existence of such Hazardous Materials has been disclosed to Contractor in this Agreement or in documents provided to Contractor prior to execution of this Agreement. Pollution liability insurance shall provide coverage for third-party injury and property damage claims, including, without limitation, cleanup costs, as a result of pollution conditions or contamination arising from Contractor's operations and completed operations. Such completed operations coverage will remain in effect for a period of time equal to the longer of the following: (1) two (2) years following date of Final Completion and acceptance of the Work by the Owner or (2) expiration of the applicable statute of limitations for patent and latent construction defect claims. Such policy shall have a retroactive date before the start of the Work. The limits of such coverage shall be no less than \$2,000,000 per claim and \$2,000,000 in the aggregate.

C. Builder's Risk Coverage. Owner shall purchase, and shall thereafter maintain for the duration of the Contract Time, or such extended periods as may be required by the Contract Documents, builder's risk insurance on the entire Work (not including Contractor's tools or equipment) and on all portions of the Work located: (1) at the Site; (2) stored off the Site that are segregated from other materials and are identified as designated for the Project; and (3) in transit, and written on the completed value basis and covering the replacement cost thereof.

D. Coverage Limits. The inclusion of required minimum limits shall not be construed as limiting Owner's rights under any insurance policy containing higher limits. Neither receipt or acceptance of insurance policies, certificates, or endorsements showing less or difference coverage than required, nor any forbearance or omission by or on behalf of Owner with respect to the insurance requirements set forth in this exhibit shall be deemed a waiver of, or estoppel to assert, any right or obligation regarding those insurance requirements.

E. Insurer Rating. The insurance required of Contractor shall be placed with insurers licensed to do business and admitted in the State where the Site is located and having an A.M. Best Company rating of no less than A-VIII, unless otherwise approved by Owner in writing.

F. Certificates of Insurance. Endorsements and certificates of insurance (including, without limitation, additional insured endorsements or certificates) acceptable to the Owner evidencing all insurance coverages (excepting those relating solely to insurance coverage required by Paragraph A, 5, above, which certificates and endorsements shall only be required to be provided to Owner if requested by Owner) shall be filed with the Owner prior to commencement of the Work. Owner shall have the right to require complete, certified copies of all required policies at any time. In jurisdictions requiring mandatory participation in a monopolistic state workers' compensation fund, the insurance certificate requirements for the coverage required for workers' compensation will be satisfied by a letter from the

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EXHIBIT "B"

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appropriate state agency confirming participation in accordance with statutory requirements. Such current participation letters shall be provided every six (6) months for the duration of Contractor's performance of the Work. Review of certificates, endorsements or policies by Owner does not constitute approval as to their form or content. Endorsements shall contain a provision that requires at least thirty

(30) days' advance written notice to Owner of non-renewal, material change, cancellation or potential exhaustion of aggregate limits. Contractor shall additionally give Owner immediate written notice of any cancellation of insurance. Any provision on any certificate of insurance that states anything to the effect that it does not confer rights upon Owner is hereby deemed deleted from said certificate.

G. Additional Insureds. Contractor shall have the following named as additional insureds ("Additional Insureds") by means of endorsement to all of its policies (except for worker's compensation and, if applicable, professional liability insurance):

1. the Indemnitees;
2. the following additional persons or entities:
 - a. City of San Marcos;
 - b. IDS Real Estate Group;
3. any other persons or entities as Owner may specify;
4. contractors and consultants directly contracted by Owner to perform work on the Site or furnish services to the Project; and
5. all subsidiary companies, corporations, entities, joint ventures, LLC's or partnerships that are owned, managed or controlled by the entities listed in Clauses (1) and (2) of this Paragraph G.

Such coverage to Additional Insureds shall extend to all coverages afforded to the named insured, shall contain no special limitations on the scope of protection afforded to the Additional Insureds, shall require a waiver of subrogation in favor of all Additional Insureds, and shall provide that any failure to comply with the reporting provisions of the policy shall not affect the coverage provided to the Additional Insureds. The "Insured" clause covering Additional Insureds shall be no more restrictive than the coverage afforded by ISO CGL CG 20 10 07 04 and CG 20 37 07 04 edition and shall state that the coverage provided to the Additional Insureds is primary and non-contributing with any other insurance available to the Additional Insureds.

H. Waiver of Subrogation. Contractor shall waive, and shall require its Subcontractors, sub-subcontractors, and suppliers, of every tier, by appropriate agreements, written where legally required for validity, to waive, all rights against the Owner, other Additional Insureds, Contractor's Subcontractors, sub-subcontractors, and suppliers, of every tier, and each of its/their respective partners, agents, and employees, for any and all loss and damage arising out of, caused by, or incident to fire or other perils and hazards covered by any policy of insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the Owner as the trustee. All such waivers of subrogation shall be provided by endorsement and shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, and did not pay the insurance premium directly or indirectly and whether or not that person or entity had an insurable interest in the property damaged.

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(Construction and Design-Build)

I. Separation of Interests. All policies of insurance required to be purchased by Contractor and Subcontractors, sub-subcontractors, and suppliers shall contain standard separation of insureds or severability of interests provisions.

J. Deductibles. Contractor is responsible, without reimbursement by Owner, to bear the any loss within the amount of, any deductible that Contractor is required to provide under this exhibit. Notwithstanding any other provisions in the Contract Documents, any deductibles on insurance required to be provided by Contractor or any Subcontractor, sub-subcontractor, or supplier under the terms of this exhibit (excepting professional liability insurance, if applicable) shall not, except with the written approval of Owner granted or withheld in the Owner's sole discretion, exceed \$5,000 per occurrence and in the aggregate.

K. Subcontractors. Contractor shall require each Subcontractor, sub-subcontractor, and supplier, of every tier, performing or providing a portion of the Work to purchase and maintain insurance coverages (including, without limitation, coverage extending to Additional Insureds as required by this exhibit) on the same terms and with the same waivers and certificate, notice, and endorsement requirements as required of Contractor under this exhibit; provided, however, that (1) the coverage limits for Commercial General Liability and "Umbrella" Excess Liability Coverage insurance shall, unless otherwise approved by Owner in writing, be \$2,000,000 per occurrence/\$2,000,000 in the general aggregate and (2) unless otherwise stated in the Agreement or its exhibits, no Subcontractor, sub-subcontractor, or supplier shall be required to provide policies of insurance that include the coverage provided for in Paragraph B, above (pollution liability coverage).

II.

BONDS AND

SUBCONTRACTOR DEFAULT INSURANCE

A. Bonds.

1. Contractor Bonds. *The provisions of this Paragraph A,1 shall apply only if it is stated on the first page of the Agreement that Contractor Bonds are required.* Contractor shall, no later than the thirtieth (30th) day prior to commencing any portion of the Work at the Site, furnish to Owner a good and sufficient labor and material payment bond ("Payment Bond") and a performance bond ("Performance Bond"), each in the amount of one hundred percent (100%) of the Contract Price. The Performance Bond and Payment Bond shall be in a form and on terms satisfactory to Owner and approved by Owner in writing. The penal amounts of the Payment Bond and Performance Bond shall be increased as, when, and in the amount of any Change Orders that are executed increasing the Contract Price and Contractor shall, upon request by the Owner, provide evidence of such increases. The Payment Bond shall remain in effect until expiration of the time under applicable laws for recordation of mechanic's liens and service of stop payment notices has expired and payment has been made of all amounts alleged due by each and every Subcontractor, sub-subcontractor, and supplier, of every tier. The Performance Bond shall remain in effect and assure faithful performance of all the Contractor's obligations under the Contract Documents, including, without limitation, all obligations that survive Final Completion or termination, such as, but not limited to, the Contractor's warranty and indemnity obligations. The surety on the Payment and Performance Bonds shall be an admitted surety having an A.M. Best's Insurance Rating of not less than B+:VIII. The premiums for all Bonds are included in the Contract Price and shall be paid by the Contractor. The Payment Bond and Performance Bond shall each name the Owner as obligee, as well as Owner's lender if requested by Owner. No change or modification, of any kind, to the terms of the Contract Documents, including, without limitation, adjustments to the Contract Price or Contract Time, shall in any way release or exonerate the Contractor or its surety from their obligations, and notice thereof shall be deemed waived by the surety. If such Performance and Payment Bonds are provided, then the expense thereof shall, unless otherwise stated

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in this Agreement or otherwise approved by Owner in writing, which approval may be granted or withheld in Owner's sole and absolute discretion, be at the expense of Contractor and deemed part of the Contract Price.

2. Subcontractor Bonds/Subguard™. *The provisions of this Paragraph A,2 shall apply only if it is stated on the first page of the Agreement that Subcontractor Bonds/Subguard™ are required.*

a. Contractor Option. Contractor shall arrange to have furnished, at its own expense and as part of the Contract Price, either (1) Payment and Performance Bonds or (2) Subguard™ insurance by those Subcontractors referred to or listed on the first page of the Agreement. The Contractor shall have the option to comply with such obligation by electing to provide either Payment and Performance Bonds or Subguard™ insurance; however, such election shall be made by Contractor, as to all Subcontractors from whom Subcontractor Bonds/ Subguard™ is indicated on the first page of the Agreement to be required, prior to performance by Contractor of Work at the Site and once such election made shall not thereafter be changed as to any Subcontractor without prior written approval by Owner, which may be granted or denied in Owner's sole and absolute discretion.

b. Subcontractor Bonds. If Contractor elects to provide Payment and Performance Bonds, then Contractor shall obtain from either all trade Subcontractors performing Work or, if the Contractor's obligation to provide Subcontractor Bonds/Subguard™ is stated on the first page of this Agreement to be limited to providing Payment and Performance Bonds for only certain trade Subcontractors, from only those trade(s) listed on the first page of this Agreement. Performance and Payment Bonds provided by Subcontractors shall each be in the amount of one hundred percent (100%) of the price set forth in the Subcontractor's subcontract and shall in all other respects comply with the requirements of Paragraph A,1, above, pertaining to Performance and Payment Bonds provided by the Contractor. If Subcontractor Payment and Performance Bonds are provided, then the expense thereof shall, unless otherwise stated in the Agreement as being reimbursable by Owner to Contractor or otherwise approved by Owner, which approval may be granted or denied in Owner's sole and absolute discretion, be at the expense of Contractor (without reimbursement by Owner) and deemed included in the Contract Price. Whether or not Subcontractor bonds are required to be provided by the Agreement, every Performance Bond provided by a Subcontractor shall name the Contractor and the Owner as dual obligees, as well as, if requested by Owner, the Owner's lender, if any.

B. Subcontractor Default Insurance.

1. Contractor-Furnished Policy. If Contractor elects to provide Subguard™ Insurance, then Contractor shall obtain a Subguard™ insurance policy from Steadfast Insurance Company, a company of Zurich U.S., insuring against Subcontractor default in performance. Such policy shall name Contractor as an insured under the policy. The utilization of the Subguard™ policy shall not affect the rights and obligations of the Owner and Contractor under the Contract Documents. The Contractor shall remain fully responsible to Owner for the proper and timely performance of the Work, including performance of the Work by its Subcontractors. Contractor shall not disclose the terms of the Subguard™ policy to others without prior written approval by Owner. Said policy will, without limitation, provide for reimbursement by insurer of losses and expenses incurred by Owner in:

- a** completing a Subcontractor's obligations;
- b** correcting defective Work (including, without limitation, breach of any implied or express warranties);

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c. retaining legal or other professional services and claims administrative and other expenses in investigating a claim, adjusting a claim or defending disputes to the extent caused by the Contractor's or a Subcontractor's default in performance; and

d. reimbursing costs of liquidated damages assessed by Owner, acceleration and overhead expenses for delay to the extent caused by a Subcontractor's default in performance.

2. Limits of Coverage. The Subguard™ policy shall provide coverage with limits of (i) \$50,000,000 per occurrence, and (ii) \$50,000,000 in the aggregate.

3. Enrolled Subcontractors. Contractor shall be responsible to enroll all first tier Subcontractors in the Subguard™ policy program, unless Contractor's obligation to provide Sub Bonds/Subguard™ is indicated on the first page of this Agreement to be limited to certain trades of Subcontractors, in which case if Subguard™ is available to be purchased for fewer than all trades of Subcontractors then only those trades indicated on the first page of the Agreement shall be required to be enrolled. If such limited enrollment is not available, then all trades of Subcontractors working on the Project shall be enrolled and such enrollment, unless otherwise stated in the Agreement as being

reimbursable to Contractor, shall be at Subcontractor's expense (without reimbursement by Owner) and shall be considered included in the Contract Price.

4. Policy, Program. Contractor shall furnish to Owner a certified copy of the policy and a copy of the policy program issued by the Subguard™ policy insurer. Contractor shall carefully review such program and comply with all requirements thereof.

5. Contractor Obligations. Contractor shall comply with all obligations under the Subguard™ policy and program issued by the Subguard™ insurer, including, without limitation, the following:

a. implement an Owner-approved Subcontractor pre-qualification procedure to assure that enrolled Subcontractor will be able to carry out the terms of its subcontract or purchase order agreement;

b. provide Subcontractor enrollment information including current contract values to Owner, Zurich U.S. and Owner's insurance broker, as requested;

c. notify Owner, Zurich U.S. and Owner's insurance broker of a covered loss or a potential for a covered loss within ten (10) days;

d. investigate, adjust and defend against disputes relating to a default of performance of an enrolled Subcontractor;

e. submit satisfactory proof of loss to Owner and Zurich U.S.;

f. cooperate with Zurich U.S. in the investigation, settlement or defense of any claim or suit brought under the Subguard™ policy.

g. enforce any rights against any person or organization which may be liable to Contractor or Owner arising from a covered loss;

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EXHIBIT "B"

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h. cooperate with Zurich U.S. in the inspection and audit of Contractor's subcontracts and purchase order agreements;

i. in the event of insolvency of an enrolled Subcontractor, take all necessary steps to establish the debt owed to Contractor;

j. use all reasonable measures to prevent and to minimize a covered loss at all times including filing any claims and enforcing any liens or security interest against an enrolled defaulting Subcontractor including its property;

k. cease awarding contracts on this project to any enrolled Subcontractor that is in default of performance; and

l. participate in periodic claims and Subguard™ performance review meetings with Zurich U.S., Owner and Owner's insurance broker.

6. Deductible, Co-Payments. Contractor shall be responsible, at Contractor's own expense and (notwithstanding the terms of any cost reimbursement provisions of the Agreement) without reimbursement by Owner, for all deductibles and co-payments required under the Subguard™ policy.

7. Qualifying Loss. The minimum threshold amount for a qualifying loss payable under the Subguard™ policy shall be as follows: \$ - 0 -.

8. Assignment. The Subguard™ policy shall include a Financial Interest Endorsement, edition 11/5/04 issued by Zurich-Steadfast Insurance.

9. Contractor Actions. Contractor shall take no actions that would reduce or limit the coverage available under the Subguard™ policy.

10. Contractor Expense. If Subguard™ is provided, then the expense thereof shall, unless otherwise stated in this Agreement to be reimbursable to Contractor or unless otherwise approved by Owner in writing (which approval may be granted or withheld in Owner's sole and absolute discretion), be at the expense of Contractor and deemed part of the Contract Price.

III.

MISCELLANEOUS PROVISIONS

A. Definitions. Capitalized terms used in this exhibit shall have the same meanings as given to them in the Agreement or if not so given as defined in this exhibit. Terms that are not so defined shall be interpreted in a manner consistent with the custom and usage of such terms by the insurance and surety industry (as applicable); provided, however, that if there is more than one such interpretation then the one providing for the greater degree of protection or coverage to Owner shall be adopted in the interpretation of this exhibit. References to "Agreement" are understood to include the governing contract between Owner and Contractor to which this exhibit is attached notwithstanding whatever other title such contract may bear.

B. Design-Build. If this exhibit is attached to a contract in which the party contracting to perform the Work has agreed to perform both design and build the Work, then the following modifications are hereby deemed made to the terms of this exhibit (by way of clarification to the foregoing, the

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requirement herein for providing professional liability insurance shall only apply to a Contractor who assumes general responsibility for both the design and construction of the Project and, unless otherwise expressly stated elsewhere in the Contract Documents, shall not apply to an agreement under which the Contractor has generally agreed to perform construction only, even though such construction includes the design-build of selected trade portions of the Work, such as, without limitation, mechanical, plumbing, or fire protection): (1) all references to "Contractor" shall mean the "Design-Builder" as that term is used in the governing contract between Owner and Design-Builder to which this exhibit is attached; (2) all references to "Subcontractors" (whether singular or plural) shall (unless the terms of the Agreement or this exhibit expressly state that they do not apply to Subconsultants) mean both Subcontractors and Subconsultants retained by Design-Builder; (3) all references to "sub-subcontractor" (whether singular or plural) shall mean both sub-subcontractors and sub-subconsultants; (4) all references to "Work" shall mean the Work as defined in the governing contract between Owner and Design-Builder, and shall include, without limitation, all professional design and engineering services required to be furnished by Design-Builder or its Subcontractors or Subconsultants, of any tier; and (5) in addition to the coverages required to be provided by Design-Builder pursuant to Paragraph I, A, 1 through 6 of this exhibit, Design-Builder and each Subconsultant, of any tier, providing professional services in the performance of any portion of the Work shall be required to provide professional liability insurance coverage in accordance with the following terms, which coverage shall (except as otherwise expressly stated in this exhibit) furthermore be subject to all of the other terms and conditions set forth in this exhibit generally applicable to policies of insurance to be provided by Contractor under this exhibit:

"Professional Liability insurance issued on a "claims made" basis, with limits of liability coverage in the amount of no less than \$2,000,000 per claim and \$2,000,000 in the annual aggregate providing coverage for damages from claims for bodily injury or property damage (including, without limitation, loss of use of damaged and non-damaged property and all costs and expenses resulting from the investigation and defense of any claim, including, without limitation, investigation costs at the direction of any government or quasi-government entity) due to any breach of duty in the performance of professional services. Professional liability coverage shall have an inception date or a retroactive date coinciding with or prior to the date of execution of the Agreement or the date of first performance of any Work (including, without limitation, any professional services) for the Project, whichever date is earlier, and coverage shall continue uninterrupted until five (5) years after Final Completion and acceptance by Owner of the Project. Coverage for such post-completion period may be provided by renewal or replacement of the policy for each of five (5) years or by a five-year extended reporting period endorsement that reinstates the aggregate limit for the extended reporting period. Renewal or replacement policies shall not allow for any advancement of the retroactive date. Any deductible or self-insured retention under any professional liability policy shall not, except with the written approval of Owner granted or withheld in the Owner's sole discretion, exceed Fifty Thousand Dollars (\$50,000)."

C. Waiver. Provisions of this exhibit shall only be modified or waived by Owner pursuant to a writing signed by Owner and Contractor expressly stating that it constitutes a modification or waiver of rights. No waiver of rights under this exhibit shall be implied from any statements made by, or conduct of, the Owner. No payments shall be due under the Agreement until all required certificates and bonds evidencing compliance with the requirements of this exhibit have been provided. No commencement or performance by Contractor of any portion of the Work, whether done with or without the knowledge or consent of Owner, and no partial occupancy or taking of possession of the Work by Owner shall under any circumstances be interpreted or enforced as a waiver by Owner of any of its rights, or a release of Contractor from any of its obligations under, this exhibit.

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D. Breach. Failure by Contractor of any Subcontractor, sub-subcontractor, or supplier, of any tier, to comply with the requirements of this exhibit shall constitute a material breach by Contractor of the Agreement whereupon Owner may exercise any rights and remedies, including, without limitation, the right (but not the obligation) to purchase any insurance and bonds that Owner deems, in its discretion, to be necessary to afford the protections intended to be provided under the terms of this exhibit and to withhold or otherwise recover from the Contractor the cost and premiums thereof. If Contractor or a Subcontractor, sub-subcontractor, or supplier is out of business or otherwise unavailable at the time that a claim or demand is presented to Owner, to the extent permitted by applicable law, Contractor or such Subcontractor, sub-subcontractor, or supplier (as applicable) shall be deemed to have assigned to Owner each and all of its rights under any potentially applicable policy of insurance.

E. Survival. All obligations of Contractor that expressly or by implication continue beyond, or extend protections to Owner against losses occurring after, termination of the Agreement or full performance of the Work shall be deemed to survive such termination or full performance.

EXHIBIT "C"
RELEASE FORMS
Page 1 of 4

**CONDITIONAL WAIVER AND RELEASE ON
PROGRESS PAYMENT**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT, A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information

Name of Claimant: _____
Name of Customer: _ City of San Marcos _____
Job Location: _ 186 Santar Place _____
Owner: _ City of San Marcos _____
Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _ City of San Marcos _____
Amount of Check: \$ _____
Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$ _____

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

EXHIBIT "C"
RELEASE FORMS
Page 2 of 4

**UNCONDITIONAL WAIVER AND RELEASE ON
PROGRESS PAYMENT**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information

Name of Claimant: _____
Name of Customer: __ City of San Marcos _____
Job Location: __ 186 Santar Place _____
Owner: __ City of San Marcos _____
Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature

Claimant's Signature: _____
Claimant's Title: _____
Date of Signature: _____

EXHIBIT "C"
RELEASE FORMS
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**CONDITIONAL WAIVER AND RELEASE ON FINAL
PAYMENT**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information

Name of Claimant: _____
Name of Customer: __ City of San Marcos _____
Job Location: __ 186 Santar Place _____
Owner: __ City of San Marcos _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: __ City of San Marcos _____
Amount of Check: \$ _____
Check Payable to: _____

Exceptions

This document does not affect any of the following:
Disputed claims for extras in the amount of: \$ _____

Signature

Claimant's Signature: _____
Claimant's Title: _____
Date of Signature: _____

EXHIBIT "C"
RELEASE FORMS
Page 4 of 4

**UNCONDITIONAL WAIVER AND RELEASE ON
FINAL PAYMENT**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information

Name of Claimant: _____

Name of Customer: ___ City of San Marcos _____

Job Location: ___ 186 Santar Place _____

Owner: ___ City of San Marcos _____

Unconditional Waiver und Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect the following:

Disputed claims for extras in the amount of: \$ _____

Signature

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

APPLICATION FOR PAYMENT

Contractor: _____
 Contractor Address: _____
 Property Name/Contract No.: _____

APPLICATION NO.: _____
 PERIOD COVERED: _____
 APPLICATION DATE: _____

APPLICATION FOR PAYMENT

APPLICATION IS MADE FOR PAYMENT AS HEREINAFTER SHOWN.
 CONTINUATION SHEET IS ATTACHED.

ORIGINAL CONTRACT AMOUNT (C) _____ -
 CHANGE ORDERS THROUGH _____ (D) _____ -
 TOTAL CONTRACT SUM TO DATE (E) _____ -

TOTAL COMPLETED AND STORED TO DATE (H) _____ -
 LESS RETENTION (J) _____ -
 TOTAL COMPLETED LESS RETENTION _____ -
 LESS PREVIOUS APPLICATIONS (F - G) _____ -
 TOTAL AMOUNT DUE THIS APPLICATION (L) _____ -
 BALANCE TO COMPLETE INCLUDING RETENTION _____ -

JOINT CHECK REQUEST
 (SEE CONTINUATION SHEET)

CONTRACTORS SWORN STATEMENT

The Affiant _____ *NAME* _____ being first duly sworn on oath deposes and says that he/she is _____ *TITLE* _____ of _____ *COMPANY NAME* _____ who has contracted with _____ *OWNER'S NAME* _____ above described property in said County to with: _____ *CITY, STATE* _____ owned by _____ *OWNER'S NAME* _____ or purposes of said contract, the vendors/contractors in the attached continuation sheet have been contracted with and have furnished or are furnishing and preparing materials for said improvement. That there are no other persons with contracts for labor and/or materials for said improvement. That there is due and to become due said vendors/contractors, respectively the amounts set opposite their names for materials and/or labor as stated. That all lien waivers provided to Owner are true, correct, and genuine and delivered unconditionally and there is no claim either legal or equitable to defeat the validity of said waivers. That this statement is made to said Owner for the purpose of procuring payment from said Owner. That this payment application on said contract, is a full, true, and complete statement of all such vendors/contractors, and of the amounts paid, due, and to become due to them.

 SIGNATURE

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of _____ California _____ County of _____

On _____ DATE _____ before me, _____

Personally appeared _____



Place Notary Seal Above

Who proved to me on the basis of satisfactory evidence to be the person whose name subscribed to the within instrument and acknowledged to me that he/she executed the same is his/her authorized capacity, and that by his/her signature on the instrument in person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the st _____ California _____ that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

WO-XX-TBD
EXHIBIT "E"
DRAWINGS, SPECIFICATIONS AND REFERENCE DOCUMENTS
Page 1 of 68

Scope of Work drawings, sketches, and other items attached hereto:

Item Number	Item Title	Item Producer	Item Date
1	Canopy Repaint	PBK-WLC	11/01/21
2	Masonry Wall Crack Repair	PBK-WLC	11/01/21
3	Guardrail Repair	PBK-WLC	11/01/21
4	CMU Wall Cap Repair	PBK-WLC	11/01/21
5	High Temperature Lining System Installation	PBK-WLC	11/01/21
6	Burn Room Floor Plan	PBK-WLC	11/01/21
7	Burn Room Reflected Ceiling Plan	PBK-WLC	11/01/21
8	Burn Room Section A	PBK-WLC	11/01/21
9	Burn Room Elevations	PBK-WLC	11/01/21
10	Burn Room Elevations	PBK-WLC	11/01/21
11	Burn Room Detail A Installation	PBK-WLC	11/01/21
12	Attachment 1	Various - see below	11/01/21
n/a	Results of Structural Site Review (16 pages)	R. M. Byrd and Associates, Inc.	05/12/21
09 90 00	Painting Specification (9 pages)	PBK-WLC	Dec 2018
11 95 11	High Temperature Lining Systems Specification (5 pages)	PBK-WLC	12/16/18
n/a	Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary (19 pages)	R. M. Byrd and Associates, Inc.	11/01/21
n/a	SikaGrout-428FS Product Data Sheet (5 pages)	Sika Corporation	Nov 2020

Proposal Form (Lump Sum Pricing) for San Marcos Training Tower dated January 26, 2022 - one (1) page

Above items, Pre-Submittal Meeting Minutes, RFP addendum, and any TBD future items can be found here:

<https://spaces.hightail.com/space/F7ZqlgofEo>



Roof Deck Canopy



Canopy/ Roof Deck (Level 5)

A

B

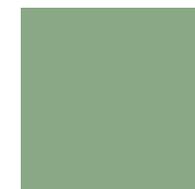


KEY PLAN

KEYNOTES

- A** Repaint, color selected by Architect, typ.
- B** Rust mitigation required, typ.

Notes:
 1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
 2. Reference Specification Section 09 90 00 - Painting - Attachment 1.



Dunn Edwards
 DE5641 "Mermaid's Cove"
 Color Selected



Canopy East View



Canopy South View



Burn room exterior



A



A

A



A

CMU crack detail



KEY PLAN

KEYNOTES

- A** Remove and replace two levels of 8" face shells on the East and South walls (11 and 12 courses).
- B** Extent of repair up to control joint.

Notes:
 1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.



Burn room exterior



CMU Color Selected

Angelus Block
 "Greystone" Split Face

A

B

San Marcos Training Tower

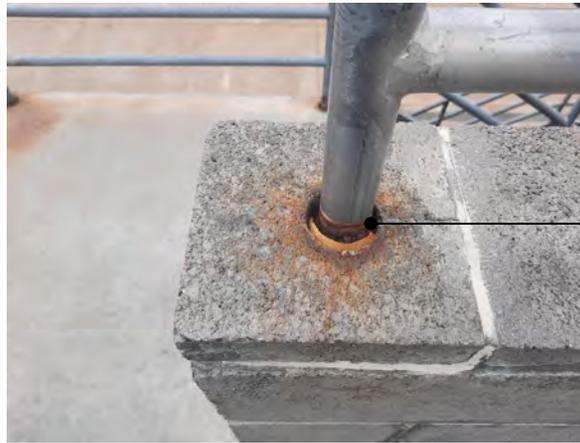
Masonry Wall Crack Repair | 11/01/2021 | 02





Upper Level guardrail

B



Detail view of rusted post embedment

A



KEY PLAN



Detail view of rusted post embedment

A

KEYNOTES

- A Rust mitigation - remove all rust and paint with proper galvanize coating at all post. Remove all existing grout/epoxy adhesive from all post embedments and prepare/apply non-shrink grout (SikaGrout®), typ.
- B Extent of work - West and South side of guardrails at upper level (adjacent to platform) and East and South side of guardrails at stair landing.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.

2. Reference SikaGrout® - 428 FS - Attachment 1.



Detail view of CMU wall



Detail view of CMU wall



KEY PLAN



Overall view of CMU wall



Angelus Block
"Natural Gray" Precision

CMU Wall Cap Color Selected

KEYNOTES

- A Clean and prepare surface for new CMU wall cap.



Current interior view of Burn Room



Current interior view of Burn Room



KEY PLAN 



Current interior view of Burn Room



Proposed new high temperature lining system

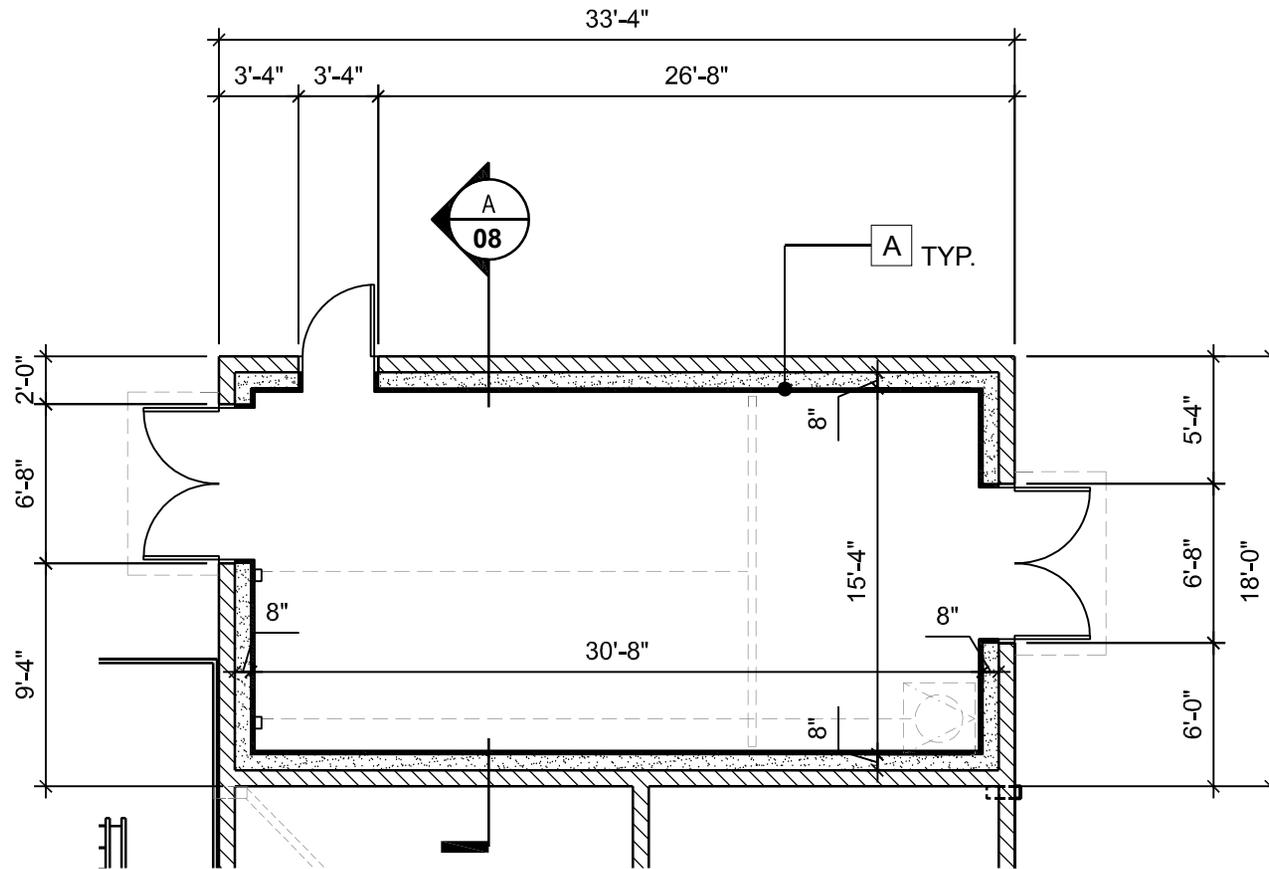
KEYNOTES

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.



KEY PLAN 



Scale: 1/8" = 1'-0"



KEYNOTES

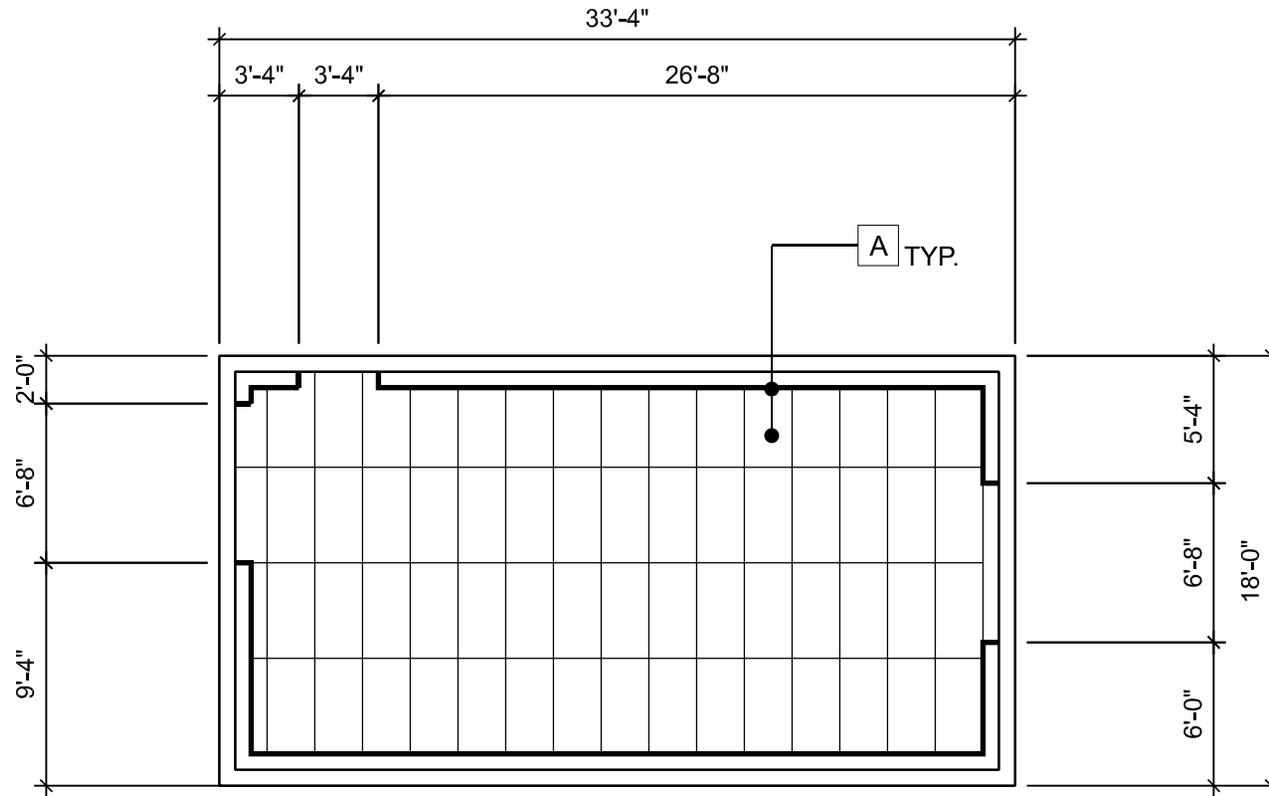
- A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.



KEY PLAN 



KEYNOTES

- A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

- Notes:
1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
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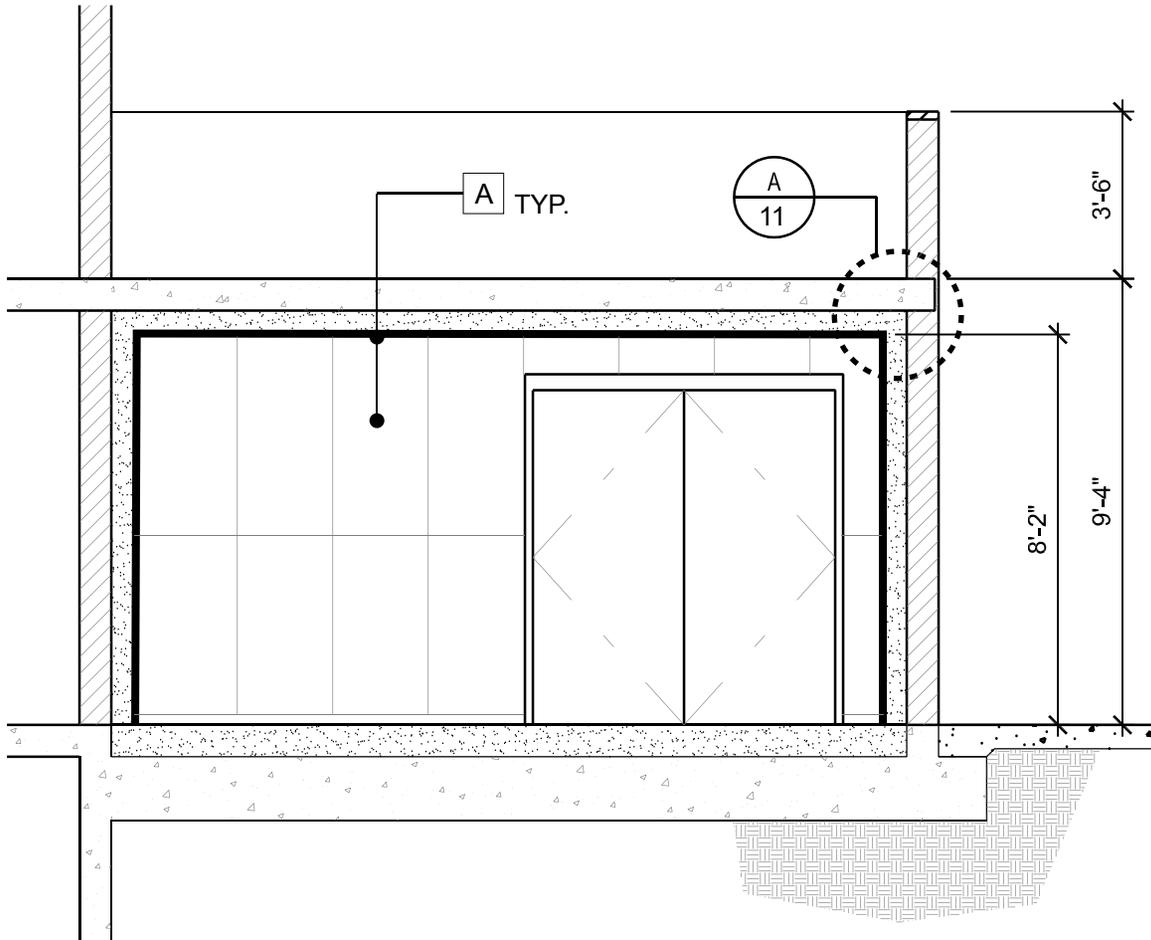
Scale: 1/8" = 1'-0"



San Marcos Training Tower

Burn Room Reflected Ceiling Plan | 11/01/2021 | 07





Scale: 1/4" = 1'-0"



KEY PLAN 

KEYNOTES

- A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

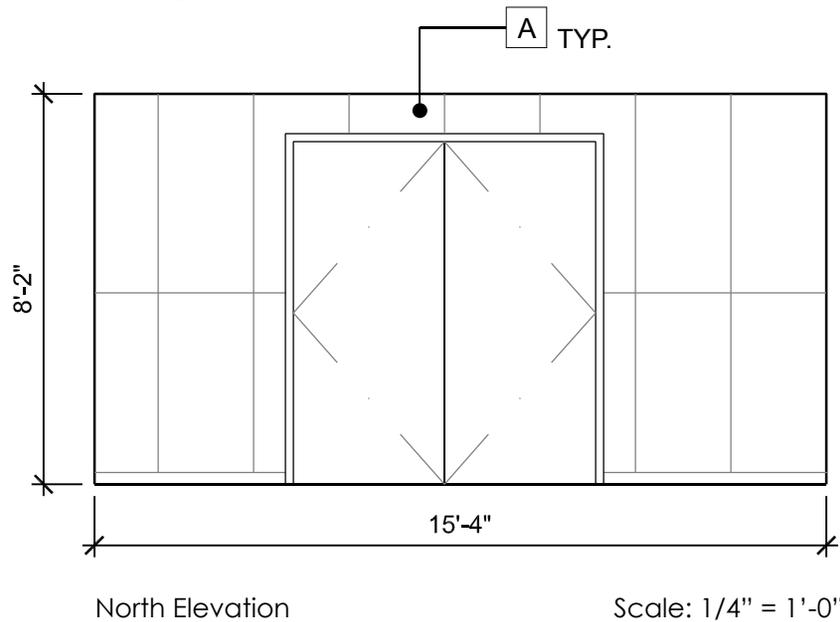
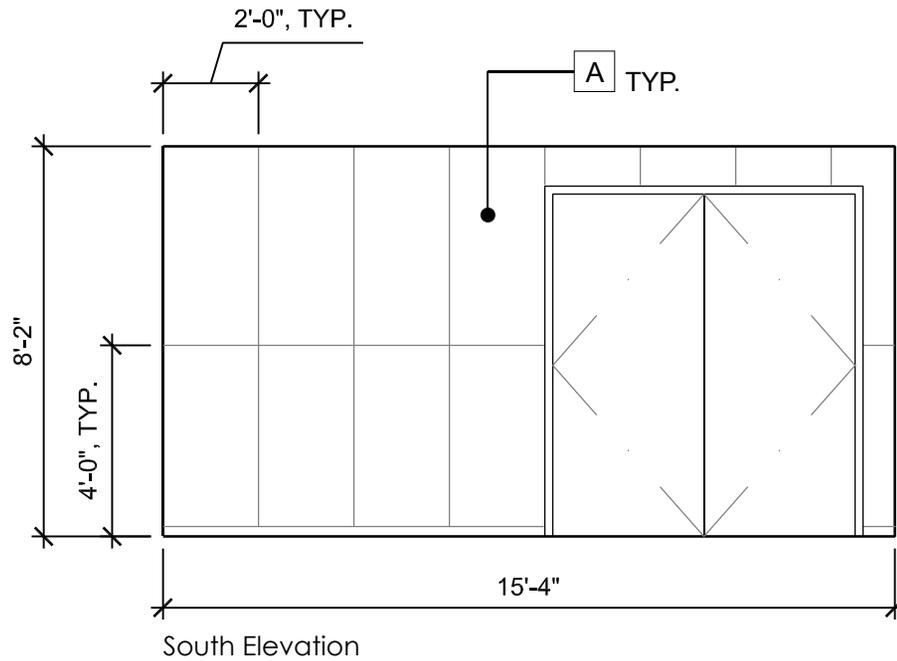
Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

San Marcos Training Tower

Burn Room Section A | 11/01/2021 | 08





Scale: 1/4" = 1'-0"



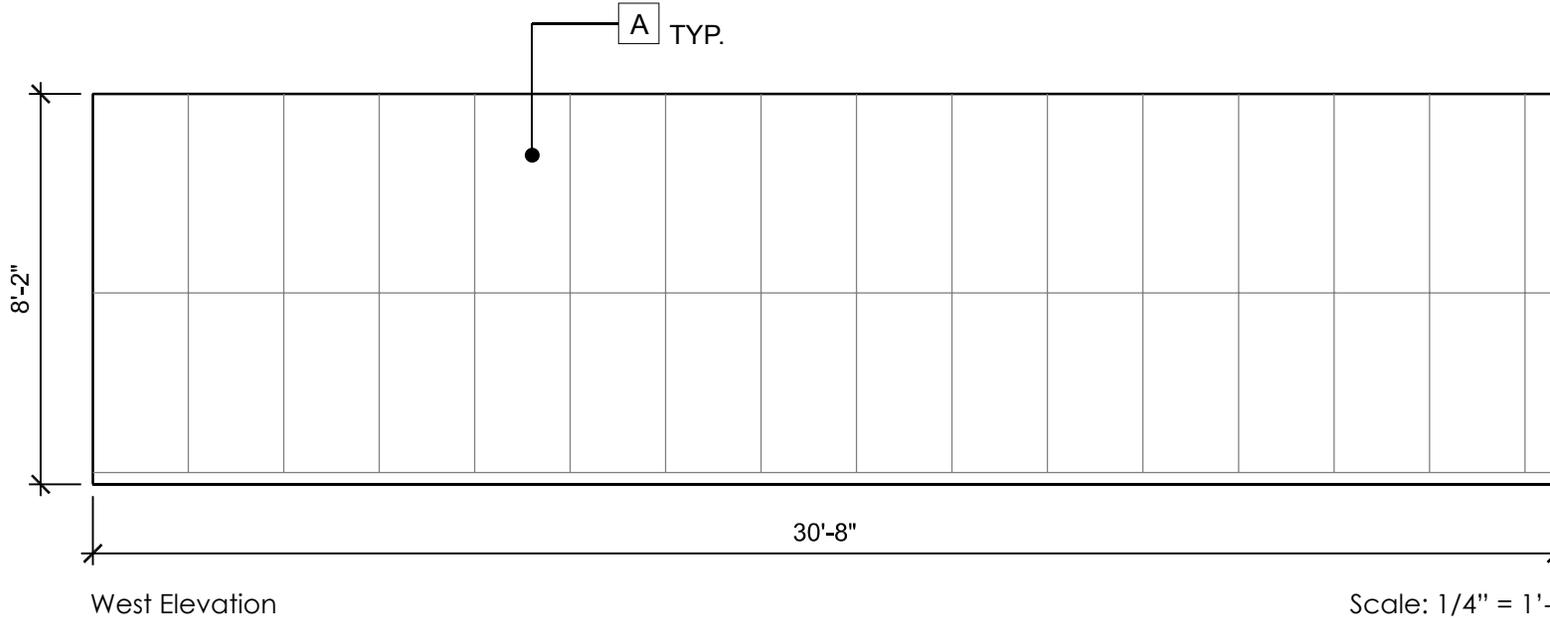
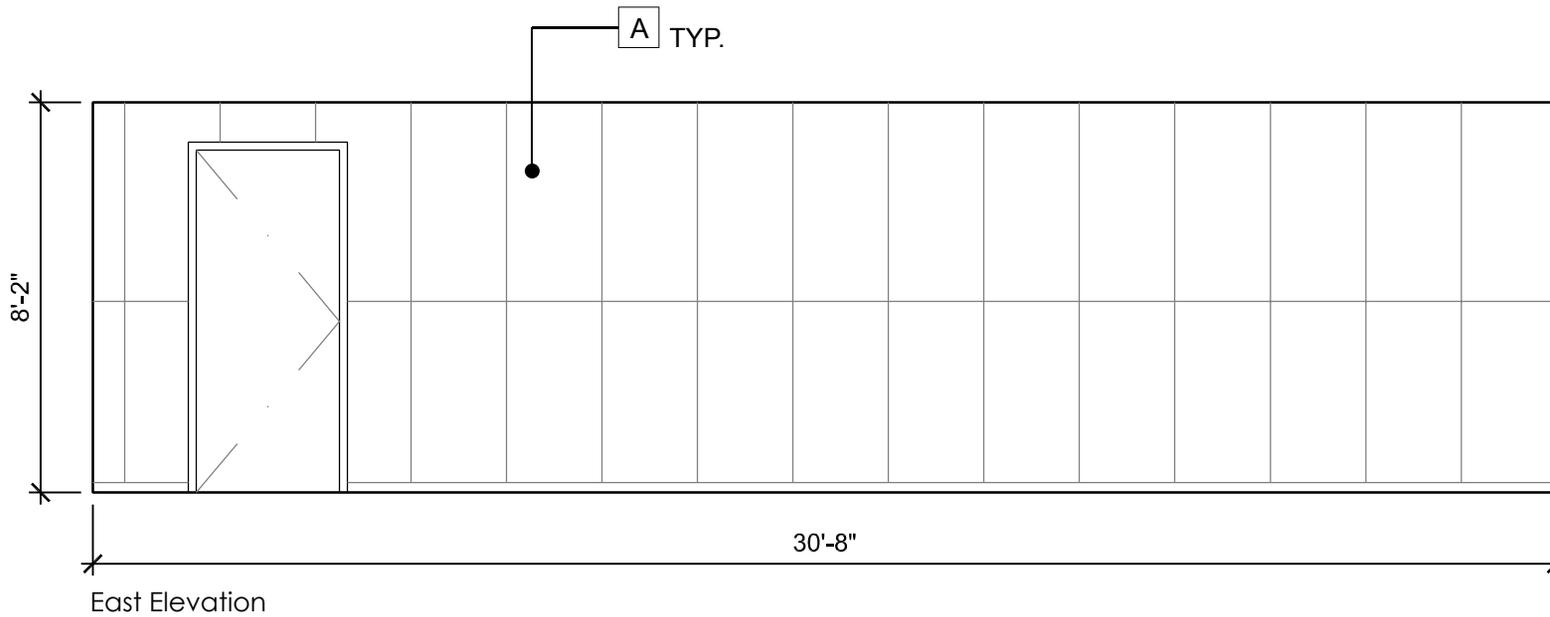
KEY PLAN 

KEYNOTES

- A** (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.



Scale: 1/4" = 1'-0"



KEY PLAN

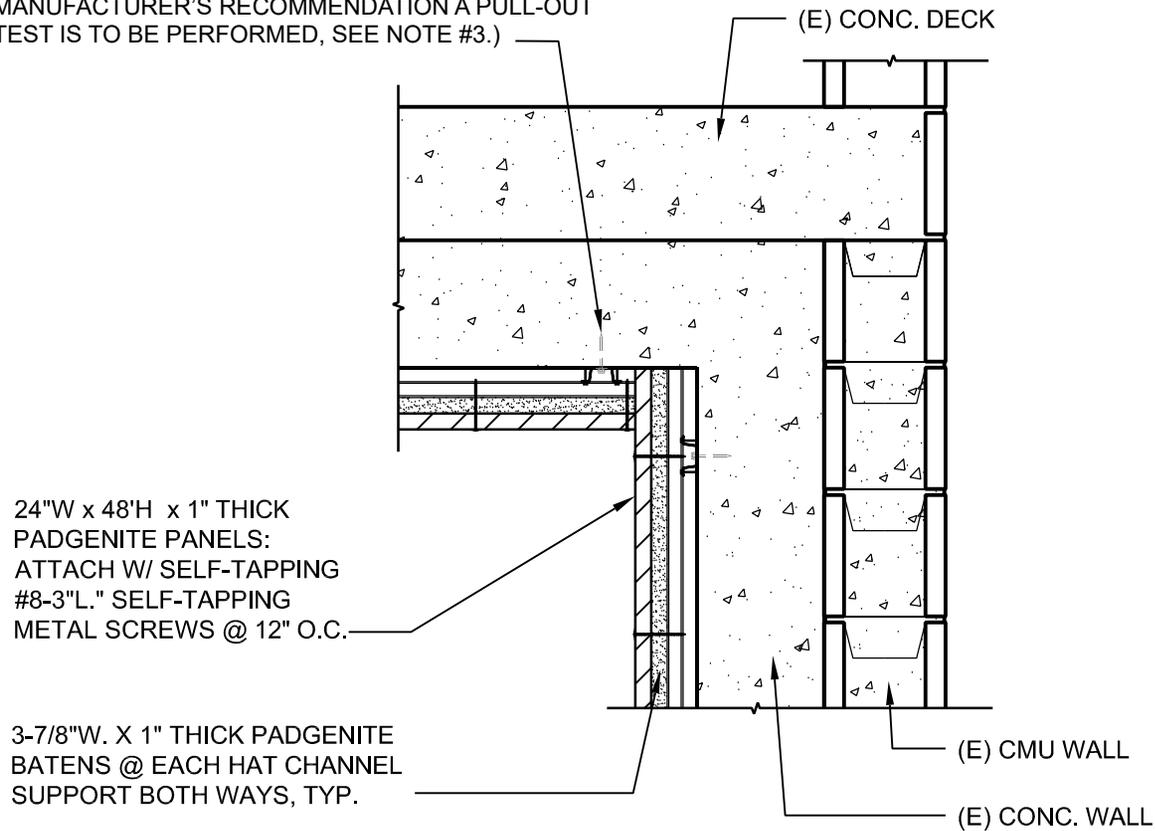
KEYNOTES

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@ Walls, Ceiling and Doors/Frames, typ.

Notes:

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3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

7/8" x 18GA. GALV. HAT CHANNEL AT 48" O.C., ATTACH W/ 3/8" x 3-1/2" CONC. FASTENERS (PER THE MANUFACTURER'S RECOMMENDATION A PULL-OUT TEST IS TO BE PERFORMED, SEE NOTE #3.)



24"W x 48"H x 1" THICK PADGENITE PANELS: ATTACH W/ SELF-TAPPING #8-3"L." SELF-TAPPING METAL SCREWS @ 12" O.C.

3-7/8"W. X 1" THICK PADGENITE BATENS @ EACH HAT CHANNEL SUPPORT BOTH WAYS, TYP.

(E) CONCRETE DECK

(E) CMU WALL

(E) CONCRETE WALL

NOTE: THE CONTRACTOR IS TO PROVIDE SHOP DRAWINGS AND ENGINEERED DETAILS FOR PADGENITE PANELS (WALLS, CEILING, DOOR AND FRAMES, ETC.).

KEYNOTES

- Notes:
1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
 2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
 3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

ATTACHMENT 1

- R.M. Byrd and Associates, Inc. - Results of Structural Site Review
- Section 09 90 00 - Painting
- Section 11 95 11 - High Temperature Lining Systems
- R.M. Byrd and Associates, Inc. - Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary
- SikaGrout® - 428 FS



May 12, 2021

City of San Marcos
c/o IDS Real Estate Group
629 J Street, Suite 204
San Diego, CA 92101

Attention: Hannah Schraeger, Associate
Subject: San Marcos Training Tower
Re: Results of Structural Site Review

Dear Mrs. Schraeger,

Per the request of the City of San Marcos, RM Byrd and Associates performed a site review of the existing San Marcos Fire Training Tower. The review is for general structural field conditions and identification of identifiable deleterious conditions or effect, in accordance with NFPA review requirements.

The review was performed by Rick Byrd, S.E, on April 1st, 2021. The original Training Tower was designed by RM Byrd in 2000.

Each level was reviewed for visible signs of deterioration or impacts of tire training activity on the structural components.



Roof Deck and Canopy (Level 5) (Photo 2, 3)

The upper roof deck and canopy condition is considered “good”. The canopy structure indicates signs of rust, which will require mitigation of the rust and new paint to assure continued long range performance. Current level of rust does not appear to impact structural integrity of metal deck or structural steel. The steel column yoke assemble to the East has an apparent beehive inside the structural steel HSS horizontal member, which shall be mitigated.

Concrete roof deck condition at level 5 appears excellent.

Training Levels 2, 3 and 4.

The condition of masonry walls, concrete floors and structural steel stair components is excellent and indicative of the excellent maintenance procedures in place. Roof of Level 4 indicates no signs of adverse conditions.

At handrail embeds there is very minor rust indication at the concrete handrail embed at exterior slab, which shall have the rust removed and re-painted to prevent any long term impact of rust and subsequent

concrete spalling. (Photo 4) This is a common issue on training towers, and all exposed handrail embeds in concrete slab will benefit from continued rust mitigation and paint at these conditions. (Photo 5)

Exterior masonry at levels 2, 3 and 4 appears excellent with no significant deleterious indicators.

Training Level 1

Training level 1 outside the burn room area is noted as “good”, with no deleterious indicators. (Photo 6)

The Burn Room Training activity of Level 1 is limited to the dedicated burn room, ground floor, East side. The structural protection from fire activity is provided by trowel on Refractory Concrete. The refractory concrete had spalled in some instances, and protection of the structure is impacted. (Photos 7 and 8). The heat effects on the east masonry wall have apparently caused a longitudinal, continuous horizontal crack in the masonry, which traverses two levels of 8” face shells. The extent of the crack is the full length of the East, with a minor return on the South side. (Photos 9-18)

Repair of the masonry crack is required, and the process is defined in Attachment 1. The crack repair involves removing the face shells at the building exterior, pressure injecting the crack with epoxy as a structural repair, and replacing the face shells with an epoxy application. The extent of removal, color and material selection of the replacement face shells shall be by the architect.

It is recommended that the burn room be considered for the application of High Temperature Lining, which has greater effective protection of structural surfaces than the Refractory Concrete. This is currently a popular retrofit for Training Towers with similar application.

Should you have any questions or require additional information please do not hesitate to contact our office.

Sincerely,



Rick Byrd, S.E.
President





Photo 1



Photo 2



Photo 3





Photo 4



Photo 5



Photo 6





Photo 7



Photo 8



Photo 9





Photo 10



Photo 11



Photo 12





Photo 13



Photo 14



Photo 15





Photo 16



Photo 17

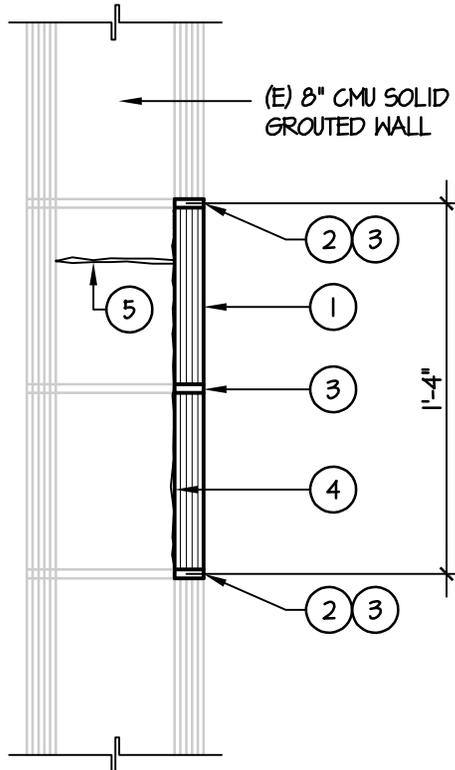


Photo 18



ATTACHMENT 1





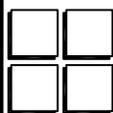
- ① REMOVE TWO COURSES OF FACE SHELL TO A MAXIMUM THICKNESS OF 1 5/8". PROVIDE REPLACEMENT FACE SHELL AS DIRECTED BY ARCHITECT.
- ② REMOVE MORTAR AT EXISTING JOINT AT TOP AND BOTTOM OF NEW FACE SHELLS.
- ③ PROVIDE REPLACEMENT EPOXY MORTAR FULL DEPTH OF MORTAR JOINT, ALL HORIZONTAL AND VERTICAL JOINTS (SIKADUR 32 OR EQUIVALENT)
- ④ PROVIDE SIKA EPOXY BASED BONDING ADHESIVE, SUCH AS SIKADUR 32 OR EQUIVALENT. SUBMIT ANY ALTERNATE TO ENGINEER FOR APPROVAL. SURFACE TO BE PREPARED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- ⑤ EXISTING CRACK IN MASONRY WALL TO BE REPAIRED WITH PRESSURE INJECTED EPOXY. PROCESS TO BE EXECUTED BY A COMPANY WITH MINIMUM 5 YEARS OF EXPERIENCE IN MASONRY AND CONCRETE WALL PRESSURE INJECTION CRACK REPAIR. PRODUCT SHALL BE SIKADUR 52 OR EQUIVALENT. SUBMIT ANY ALTERNATE TO ENGINEER FOR APPROVAL.



MASONRY WALL CRACK REPAIR

R.M. BYRD AND ASSOCIATES INC.

Consulting Structural Engineers



1047 WEST SIXTH STREET, SUITE A
 ONTARIO, CA. 91762
 Phone: (909) 983-5599
 Fax: (909) 983-4456
 WWW.RMBYRD.COM

JOB NO. : JOBNO 90-1039

SAN MARCOS TRAINING FACILITY

Sikadur® 52

Advanced, very-low-viscosity,
moisture-tolerant epoxy injection adhesive

Description	Sikadur® 52 is a 2-component, 100% solids, moisture-tolerant, epoxy adhesive. It is a low-viscosity, high-strength adhesive formulated specifically for grouting both dry and damp cracks. It conforms to the current ASTM C-881, Types I and II, Grade-1, Class C and AASHTO M-235 specifications.
Where To Use	<ul style="list-style-type: none"> ■ Use neat for gravity feed or pressure injection of cracks in structural concrete, masonry, wood, etc. ■ Seal interior slabs and exterior above grade slabs from water, chlorides and mild chemical attack and to improve wearability.
Advantages	<ul style="list-style-type: none"> ■ Tenacious crack-sealing grout. ■ Convenient easy mix ratio A:B = 2:1 by volume. ■ Advanced low-viscosity structural resin. ■ Unique, high-strength adhesive for 'can't dry' cracks.
Coverage	1 gal. yields 231 cu. in.
Packaging	3 gallons units.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	2 years in original, unopened containers		
Storage Conditions	Store dry at 40°-95°F (4°-35°C). Condition to 65°-75°F (18°-24°C) before using.		
Color	Clear, pale yellow.		
Mixing Ratio	Component 'A': Component 'B' = 2:1 by volume.		
Viscosity (Mixed)	Approximately 200 cps.		
Pot Life	Approximately 30 minutes. (60 gram mass)		
Tensile Properties (ASTM D-638)			
14 day	Tensile Strength	7,900 psi (54 MPa)	
	Elongation at Break	3.1%	
	Modulus of Elasticity	2.0 X 10 ⁵ psi (1,400 MPa)	
Flexural Properties (ASTM D-790)			
14 day	Flexural Strength (Modulus of Rupture)	5,400 psi (37.2 MPa)	
	Tangent Modulus of Elasticity in Bending	3.8 X 10 ⁵ psi (2,620 MPa)	
Shear Strength (ASTM D-732)	14 day	Shear Strength	4,300 psi (29.6 MPa)
Bond Strength (ASTM C-882): Hardened Concrete to Hardened Concrete			
2 day (dry cure)	Bond Strength	3,000 psi (20.6 MPa)	
14 day (moist cure)	Bond Strength	2,200 psi (15.1 MPa)	
Heat Deflection Temperature (ASTM D-648)			
14 day	122°F (50°C)	[fiber stress loading = 264 psi (1.8 MPa)]	
Water Absorption (ASTM D-570)	7 day	(2 hour boil)	1.5%
Compressive Properties (ASTM D-695)			
Compressive Strength, psi (MPa)			
	40°F* (4°C)*	73°F* (23°C)*	90°F* (32°C)*
8 hour	-	-	90 (0.62)
16 hour	-	3,000 (20.6)	7,300 (50.3)
1 day	-	4,500 (31.0)	8,400 (57.9)
3 day	1,800 (12.4)	10,000 (68.9)	8,700 (60.0)
7 day	6,100 (42.0)	11,300 (77.9)	10,400 (71.7)
14 day	6,800 (46.8)	11,700 (80.6)	10,400 (71.7)
28 day	8,400 (57.9)	12,000 (82.7)	10,400 (71.7)



PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

PRODUCT DATA SHEET

Sikadur[®]-32 Hi-Mod

High-modulus, high-strength, epoxy bonding/grouting adhesive

PRODUCT DESCRIPTION

Sikadur[®]-32 Hi-Mod is a multi-purpose, 2-component, 100 % solids, moisture-tolerant structural epoxy adhesive. It conforms to the current ASTM C-881 Types I, II, and V, Grade 2, Class C and AASHTO M-235 specifications.

USES

Sikadur[®]-32 Hi-Mod may only be used by experienced professionals.

- Bond fresh, plastic concrete to hardened concrete and steel.
- Grout horizontal cracks in structural concrete and wood by gravity feed.
- Machinery and 'robotic' base-plate grout.
- Structural adhesive for concrete, masonry, metal, wood, etc.

CHARACTERISTICS / ADVANTAGES

- High-strength bonding/grouting adhesive.
- Tolerant to moisture before, during and after cure.
- Excellent adhesion to most structural materials.
- Convenient easy-to-mix ratio A:B = 1:1 by volume.
- Easy-to-use for bonding/grouting applications.
- Fast initial set; rapid gain to ultimate strengths.
- USDA-certified for use in food plants.

PRODUCT INFORMATION

Chemical Base	100 % epoxy	
Packaging	1, 2 and 4 gal. units	
Color	Concrete gray	
Shelf Life	2 years in original, unopened containers	
Storage Conditions	Store dry at 40–95 °F (4–35 °C). Condition material to 65–75 °F (18–24 °C) before using.	
Viscosity	Approximately 4–5,000 cps.	
Water Absorption	0.21 % (7 days, 24 h immersion)	(ASTM D-570) 73 °F (23 °C) 50 % R.H.

TECHNICAL INFORMATION

Compressive Strength	40 °F*	73 °F*	90 °F*	(ASTM D-695)
	(4 °C)	(23 °C)	(32 °C)	
8 hour	-	140 (1.0)	1,700 (11.7)	
16 hour	-	4,800 (33.1)	7,300 (50.3)	
1 day	30.0 (0.2)	5,700 (39.3)	7,300 (50.3)	
3 day	5,300 (36.6)	11,300 (77.9)	10,400(71.7)	
7 day	9,600 (66.2)	11,800 (81.4)	10,400(71.7)	
14 day	11,900 (82.1)	12,200 (84.1)	10,400(71.7)	
28 day	12,600 (86.9)	12,200 (84.1)	10,500(72.4)	
*Material cured and tested at the temperatures indicated.				
Modulus of Elasticity in Compression	2.1 x 10 ⁶ psi (1,449 MPa) (7 days)			(ASTM D-695) 73 °F (23 °C) 50 % R.H.
Flexural Strength	7,000 psi (48.3 MPa) (14 day)			(ASTM D-790) 73 °F (23 °C) 50 % R.H.
Modulus of Elasticity in Flexure	6.0 x 10 ⁵ psi (4,800 MPa) (14 day)			(ASTM D-790) 73 °F (23 °C) 50 % R.H.
Tensile Strength	6,900 psi (48 MPa) (7 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Tensile Modulus of Elasticity	5.4 x 10 ⁵ psi (3,726 MPa) (14 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Elongation at Break	1.9 % (7 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Tensile Adhesion Strength	2 day (moist cure)	Plastic Concrete to	1,700 psi	(ASTM C-882) 73 °F (23 °C) 50 % R.H.
		Hardened Concrete	(11.7 MPa)	
		Hardened Concrete to	2,000 psi	
	Hardened Concrete	(13.8 MPa)		
	Hardened Concrete to Steel	1,900 psi		
	(13.1 MPa)			
14 day (moist cure)	Plastic Concrete to	2,200 psi		
	Hardened Concrete	(15.1 MPa)		
	Hardened Concrete to	2,000 psi		
	Hardened Concrete	(13.8 MPa)		
	Hardened Concrete to Steel	2,000 psi		
		(13.8 MPa)		

Shear Strength	6,200 psi (43 MPa) (14 days)			(ASTM D-732) 73 °F (23 °C) 50 % R.H.
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APPLICATION INFORMATION

Mixing Ratio	Component 'A': Component 'B' = 1:1 by volume
Coverage	Bonding Adhesive: 1 gal. covers approximately 80 ft ² on smooth surface. Base Plate Grout: 1 gal. mixed with 1.5 parts oven-dried aggregate by loose volume yields approximately 420 in ³ of grout. Anchoring Grout: 1 gal. yields 231 in ³ of grout.
Product Temperature	Condition material to 65°-75°F (18°-24°C) before using.
Ambient Air Temperature	Minimum ambient temperature 40°F (4°C).
Substrate Temperature	Minimum substrate temperature 40°F (4°C).
Pot Life	Approximately 30 minutes. (60 gram mass) Approximately 22 minutes. (350 gram mass)
Contact Time	40 °F (4 °C)*: 15–16 h 73 °F (23 °C)*: 2–2.5 h 90 °F (32 °C)*: 1.5–2 h <small>*Material cured and tested at the temperatures indicated.</small>

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants.

SUBSTRATE PREPARATION

Concrete - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blast cleaning or other equivalent mechanical means.

Steel - Should be cleaned and prepared thoroughly by blast cleaning or other equivalent mechanical means.

MIXING

Pre-mix each component. Proportion equal parts by volume of Component 'A' and Component 'B' into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400-600 rpm) drill until blend is a uniform color. Mix only that quantity that can be applied within its pot life.

APPLICATION METHOD / TOOLS

To bond fresh concrete to hardened concrete - Apply by brush, roller, broom or spray. Place fresh concrete while Sikadur® 32, Hi-Mod, is still tacky. If coating becomes glossy and loses tackiness, remove any surface contaminants then recoat with additional Sikadur® 32 Hi-Mod, and proceed.

To grout baseplates - Add up to 1 1/2 parts of oven-dried aggregate to 1 part of mixed Sikadur® 32, Hi-Mod, by volume. Place grout under baseplate. Avoid contact with the underside of the plate. A 1/4 to 3/8 in. (6 to 10

mm) space should remain between the top of the grout and the bottom of the plate.

Maximum thickness of grout per lift is 1.5 in. (38 mm) If multiple lifts are needed, allow preceding layer to cool to touch before applying additional layer. The remaining 1/4 to 3/8 in. (6 to 10 mm) space should be filled with neat Sikadur® 32 Hi-Mod. Pour a sufficient quantity of neat epoxy to allow the level to rise slightly higher than the underside of the bearing plate.

To gravity feed cracks - Pour neat material into vee-notched crack. Continue placement until completely filled.

Seal underside of slab prior to filling if cracks reflect through.

LIMITATIONS

- For spray applications, consult Technical Service at 800-933-7452.
- Use only oven-dry aggregate.
- Material is a vapor barrier after cure.
- For applications on exterior, on-grade substrates, consult Technical Services at 800-933-7452.
- Do not apply over wet, glistening surface.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

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Product Data Sheet

Sikadur®-32 Hi-Mod
March 2020, Version 01.02
020204030010000129

Sale of SIKA products are subject to the Terms and Conditions of Sale which are available at <https://usa.sika.com/en/group/SikaCorp/termsandconditions.html> or by calling 1-800-933-7452.

Sikadur-32Hi-Mod-en-US-(03-2020)-1-2.pdf



SECTION 09 90 00

PAINTING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Products and application.
- C. Surface finish schedule.

1.2 SUMMARY OF PAINTED SUBSTRATES

- A. Section includes the application of paint systems on the following exterior substrates:
 - 1. Primed or unprimed steel.
 - 2. Steel roof deck.
- B. Substrate listings are for principal surfaces only. Refer to drawings, details and individual specification sections for items, surfaces, and substrates not specifically listed.

1.3 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. SSPC - The Society for Protective Coatings.

1.4 SYSTEM DESCRIPTION

- A. Preparation of all surfaces to receive final finish.
- B. Painting and finishing work of this section using coating systems of materials including primers, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- C. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- D. Painting and finishing all exterior and interior surfaces of materials including structural, mechanical, and electrical work on site, in building spaces, and above or on the roof.
- E. Paint exposed surfaces except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces.

1.5 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.6 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years documented experience.

- C. Coats: The number of coats specified is the minimum number acceptable. If full coverage is not obtained with the specified number of coats, apply such additional coats as are necessary to produce the required finish.
- D. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- E. Provide primers and undercoat paint produced by the same manufacturer as the finish coat.
- F. The minimum dry film thickness of each coat of paint shall comply with the manufacturer's recommendations for each type of paint used.

1.7 REGULATORY REQUIREMENTS

- A. Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this specification, comply with the more stringent provisions.
- B. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
- C. Comply with South Coast Air Quality Management District (SCAQMD) Rule 1113. A copy of this regulation can be obtained from <http://www.aqmd.gov/rules/reg/reg11/r1113.pdf>.
- D. In the South Coast Air Quality Management District (SCAQMD), where lower VOC contents are specified for a number of categories, certain products may be covered under the manufacturer's SCAQMD - approved Averaging Program. As a result, certain products may be fully compliant with SCAQMD Rule 1113, despite having VOC contents higher than specified limits.

1.8 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Product data for each coating type shall include as a minimum the following items. Listing shall be by manufacturer's catalog number:
 - 1. Solvent type.
 - 2. Resin type and percentage.
 - 3. Prime pigments by percent of weight.
 - 4. Reinforcing pigment by percent of weight
 - 5. Solids and volume by weight.
 - 6. VOC and RAVOC limits.
 - 7. Coverage rates and film thickness both wet and dry.
 - 8. Conformance to environmental standards listed.
 - 9. Surface preparation recommendations.
 - 10. Application, storage, clean up and disposal recommendations.
 - 11. Special instructions from the manufacturer for proper preparation and application.
- C. Provide manufacturer's technical information and instructions for application of each material proposed for use by catalog number.
- D. List each material by catalog number and cross-reference specific coating with specified finish system.

- E. Technical data sheets and all container labels must match and shall contain the same product identification numbers. The term "Series " is not acceptable.
- F. Provide manufacturer's written and signed certificate that products proposed meet or exceed specified materials.
- G. Submit samples under provisions of Section 01 33 00.
- H. Submit two samples 8-1/2 x 11 inch in size of each paint color and texture applied to cardboard. Resubmit samples until acceptable color, sheen and texture is obtained.
- I. On same species and quality of wood to be installed, submit two 4 x 8 inch samples showing system to be used for varnishes and stains.

1.9 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall surfaces and other exterior and interior components, duplicate specified finishes on at least 100 sq.ft. of surface area.
- C. Provide full-coat finishes until required coverage, sheen, color and texture are obtained.
- D. Simulate finished lighting conditions for review of field samples.
- E. After finishes are accepted, the accepted surface may remain as part of the work and will be used to evaluate subsequent coating systems applications of a similar nature.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and store and protect under provisions of Section 01 61 00.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing. Paint containers not displaying product identification will not be acceptable.
- D. Store paint materials at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain interior surface and ambient temperatures above 50 degrees F with a maximum humidity level of 50 percent for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 50 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Urethane Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 foot candles measured mid-height at substrate surface.

1.12 EXTRA MATERIAL

- A. Provide a one gallon unopened container of each color to Owner.
- B. Label each container with color, texture, and room locations in addition to the manufacturer's label.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PAINT

- A. Unless specifically identified otherwise, product designations included in this section are those that are manufactured and distributed by the Dunn-Edwards Corporation, www.dunnedwards.com and shall serve as the basis of design standard for kind, quality, performance and function.
- B. Subject to full compliance with specified requirements, other manufacturers offering equivalent products are:
 - 1. Behr Process Corp., www.behrpaint.com.
 - 2. Benjamin Moore Paints, www.benjaminmoore.com.
 - 3. Glidden Professional, www.gliddenprofessional.com.
 - 4. Kelly-Moore Paint Company, www.kellymoore.com.
 - 5. Pittsburgh Paints, www.ppg.com.
 - 6. Sherwin Williams, www.sherwin-williams.com.
 - 7. Tnemec Company, Inc., www.tnemec.com.
 - 8. Vista Paint Corporation, www.vistapaint.com.
- C. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. "Deep Tone" colors to be composed of 100 percent acrylic pigments with a colored base.
- D. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- E. Chemical Components of Interior Paints and Coatings: Shall not exceed the limitations of Green Seal's Standard GS-11 and SCAQMD Rule 1113 averaging method for VOC content and the following restrictions:
 - 1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
 - 2. Non-Flat Paints and Coatings: VOC content of not more than 50 g/L.
 - 3. Anticorrosive Coatings: VOC content of not more than 100 g/L.
 - 4. Varnishes and Sanding Sealers: VOC content of not more than 275 g/L.
 - 5. Stains: VOC content of not more than 250 g/L.
 - 6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

7. Silica Compounds: Paints and coatings, to include colorants, shall not contain any silica.
8. Restricted Components: Paints and coatings shall not contain any of the following:
 - (a) Acrolein.
 - (b) Acrylonitrile.
 - (c) Antimony.
 - (d) Benzene.
 - (e) Butyl benzyl phthalate.
 - (f) Cadmium.
 - (g) Di (2-ethylhexyl) phthalate.
 - (h) Di-n-butyl phthalate.
 - (i) Di-n-octyl phthalate.
 - (j) 1,2-dichlorobenzene.
 - (k) Diethyl phthalate.
 - (l) Dimethyl phthalate.
 - (m) Ethylbenzene.
 - (n) Ethylene Glycol.
 - (o) Formaldehyde.
 - (p) Hexavalent chromium.
 - (q) Isophorone.
 - (r) Lead.
 - (s) Mercury.
 - (t) Methyl ethyl ketone.
 - (u) Methyl isobutyl ketone.
 - (v) Methylene chloride.
 - (w) Naphthalene.
 - (x) Toluene (methylbenzene).
 - (y) 1,1,1-trichloroethane.
 - (z) Vinyl chloride.

2.3 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Wallboard : 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry : 12 percent.
 - 3. Interior Located Wood : 15 percent.
 - 4. Exterior Located Wood : 15 percent.
- D. Beginning of installation means acceptance of existing surfaces.

3.2 SURFACE PREPARATION - GENERAL

- A. Correct minor defects and clean surfaces which affect work of this Section.
- B. Shellac and seal marks which may bleed through surface finishes.
- C. Uncoated Steel and Iron: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint after repairs.
- D. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime paint steel surfaces.
- E. Existing surfaces to be recoated shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

3.3 SURFACE PREPARATION - MODERNIZATION

- A. Properly prepare all existing surfaces to receive new paint.
- B. Prior to application of any new paint, existing surfaces to be cleaned free of damaged paint, dust, corrosion, and other foreign matter which will destroy bond or mar appearance of new paint.
- C. Sand, scrape, fill and repair surfaces flush with suitable fillers. Patch and repair; feather edges to provide smooth transitions; match existing surfaces.
- D. Remove hardware and accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not-to-be-finish painted, or provide surface-applied protection. Reinstall removed items upon completion of work in each area.
- E. Existing surfaces to be painted shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be shall be spot primed with same primer as for new work.
- F. Existing paint removal:
 - 1. Remove loose, blistered, scaled, oxidized, cracked, alligatored, or defaced paint down to a sound surface.
 - 2. Brush and clean free all loose material.

3. Feather edges of removal areas to provide a smooth transition between surfaces.
- G. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.
- H. Washing and Cleaning:
 1. Remove all loose and foreign materials.
 2. At building interiors, wash all surfaces clean with approved cleaner and rinse with clean water.
 3. At building interiors, vacuum existing ceiling panels to remove all dirt and dust from the material surface. Utilize caution so as not to mar or damage the finish surface in any way.
 4. Completely remove wax from surfaces which receive new paint.
- I. Remove dust, grit, and foreign matter from existing wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks, and other defects after priming and spot prime repairs when fully cured.
- J. Ferrous metal shall be cleaned of oil, grease, and foreign matter. Cleaning method: SSPC-SP No. 1 "Solvent Cleaning".
- K. Ferrous Steel: Where raw metal surface is exposed, proceeds follows:
 1. Cleaning method: SSPC-SP No. 2 "Hand Cleaning" or No. 3 "Power Brush Cleaning" as required to remove corrosion, loose paint, and rust.
 2. Priming: Prime immediately after cleaning.
- L. Pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.

3.4 PROTECTION OF ADJACENT WORK

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.5 WORK NOT TO BE PAINTED

- A. Painting is not required on surfaces in concealed and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces and duct shafts.
- B. Do not paint metal surfaces such as stainless steel, chromium plate, brass, bronze, and similar finished metal surfaces.
- C. Do not paint anodized aluminum or other surfaces which are specified to be factory pre-finished.
- D. Do not paint sandblasted or architecturally finished concrete surfaces.

3.6 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.

- C. Apply prime coat to surfaces which are to be painted or finished.
- D. Apply each coat to uniform finish.
- E. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- F. Sand lightly between coats to achieve required finish.
- G. Allow applied coat to dry before next coat is applied.
- H. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
- I. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. Prime back surfaces of interior and exterior woodwork with primer paint.
- K. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- L. Paint mill finished door seals to match door or frame.
- M. Paint primed steel glazing stops in doors to match door or frame.
- N. Cloudiness, spotting, lap marks, brush marks, runs, sags, spikes and other surface imperfections will not be acceptable.
- O. Where spray application is used, apply each coat of the required thickness. Do not double back to build up film thickness of two coats in one pass.
- P. Where roller application is used, roll and redistribute paint to an even and fine texture. Leave no evidence of roller laps, irregularity of texture, skid marks, or other surface imperfections.

3.7 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.8 PROTECTION OF COMPLETED WORK

- A. Protect finished installation under provisions of Section 01 61 00.
- B. Erect barriers and post warning signs. Maintain in place until coatings are fully dry.
- C. Confirm that no dust generating activities will occur following application of coatings.

3.9 PATCHING

- A. After completion of painting in any one room or area, repair surfaces damaged by other trades.
- B. Touch-up or re-finish as required to produce intended appearance.

3.10 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 29.
- B. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary.
- C. The Owner will engage the services of an independent testing agency to sample paint material being used.
- D. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
- E. The testing agency will perform appropriate quantitative materials analysis and other characteristic testing of materials as required by the Owner.
- F. If test results show materials being used and their installation do not comply with specified requirements or manufacturer's recommendations, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing and repaint surfaces to acceptable condition.

3.11 COLOR SCHEDULE

- A. Paint and finish colors shall be selected by the Architect from manufacturer's entire range of standard and custom color selections and special colors selected to match or compliment the colors of other materials, equipment, or components which comprise the work.
- B. Access doors, registers, exposed piping, electrical conduit and mechanical/electrical panels: Generally the same color as adjacent walls.
- C. Exterior and interior steel doors, frames and trim: Generally a contrasting color to adjacent walls.
- D. Doors generally are all the same color, but of a contrasting color from frame and trim.
- E. Exterior and interior steel fabrications: Generally a contrasting color to adjacent walls.
- F. Exposed interior mechanical/ductwork: Generally a contrasting color to adjacent walls or ceiling.
- G. Ceilings are generally to be painted a different color than walls.
- H. Approximately 20 percent of overall painting work will be required to be "Deep Tone" colors. This work will require one additional coat of paint beyond that as specified.

3.12 SCHEDULE - EXTERIOR SURFACES

- A. Steel - Primed or Unprimed (Eggshell Urethane Alkyd Enamel)
 - 1st coat: BRPR00 Bloc-Rust Premium
 - 2nd coat: ASHL30 Aristoshield
 - 3rd coat: ASHL30 Aristoshield

END OF SECTION

SECTION 11 95 11

HIGH TEMPERATURE LINING SYSTEMS

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The installation of the specified high temperature lining systems shall include all associated work required for proper installation including, but not limited to attachments to walls and ceilings, metal support framing infrastructure and coordination with disciplines of adjacent Work within Structure, Refer to plans.
- B. Work in This Section includes the following :
 - 1. Installation of High Temperature Lining Panels on Walls.
 - 2. Installation of High Temperature Lining Panels of Ceilings.
 - 3. Installation of Cold Formed metal framing and furring for the support of High Temperature lining panels.
 - 4. High Temperature Lining Battens.
 - 5. Full-Height protective wall angles for all outside corners of lining material.
 - 6. Installation of High Temperature Lining Panels on doors and frames indicated in the Drawings.
- C. Work to include full field verification of conditions and coordination of installation with adjacent construction trades specified elsewhere and depicted within the project drawings.

1.3 RELATED SECTIONS

- A. Section 03 30 00 -Cast in Place Concrete
- B. Section 04 20 00 -Concrete Masonry Units

1.4 WARRANTY

- A. High temperature lining systems shall have a full manufacturer warranty against defects or failures for a period of not less than ten (10) years from the date of project acceptance.

1.5 SUBMITTALS

- A. Product Data: Material product and performance data and installation instructions.
- B. Shop Drawings: Provide complete drawings showing; locations, fabrication , and installation of all joints including plans, elevations , sections, details of components , and attachments to other units of Work.
- C. Samples: Provide samples of material, framing accessories and wall angel protection: Full-size sample in for each trim accessory indicated.

D. Warranty and Maintenance manuals

1.6 QUALITY ASSURANCE

- A. Employ only installers familiar with the application and installation of high temperature lining materials for fire training buildings.
- B. Installers must display a minimum of five (5) years of experience in the provision and installation of high temperature lining systems.
- C. Provide full product data and certification certifying product for the application and performance specified herein.

1.7 REFERENCE

- A. NFPA 1403: Standard on Live Fire Training Evolutions
- B. NFPA 1500: Standard on Fire Department Occupational Health & Safety

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack panels flat.

1.9 PRODUCT MAINTENANCE

- A. Provide written instructions for the proper required maintenance and replacement of high temperature panels.

1.10 ADDITIONAL PRODUCT

- A. Upon completion of installation, contractor shall provide to the owner in manufacturer packaging a minimum of the following additional materials.
 - 1. Ten (10) full size high-temperature lining panels (24" x 48").
 - 2. Ten (10) high temperature battens. (3-3/4" x 48").

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cold Formed Galvanized Framing and Furring:
 - (a) Cemco Systems
 - (b) Dietrich Industries, Inc.
 - (c) Western Metal Lath & Steel Framing Systems
 - (d) Approved Equivalent

2. Padgenite Super HD® High Temperature Lining Material

- (a) WHP Trainingtowers: 519 Duck Road, Grandview, MO 64030. TEL: (800) 351-2525 or (913) 385-3663. FAX: (800) 736-7594. Email: info@trainingtowers.com, Website: www.trainingtowers.com
- (b) Fireblast Thermal Liner
- (c) Approved Equivalent

2.2 METAL FRAMING AND FURRING

- A. Carrying Channels: Cold-rolled, commercial-steel sheet with a base metal thickness of 18- gauge, a minimum 1/2-inch-wide flange, with manufacturer's standard corrosion-resistant zinc coating.
- B. Furring Channels: Commercial-steel sheet with ASTM A 653/A 653M, G40, manufacturer's standard corrosion-resistant zinc coating.
- C. 18-gauge Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep. Minimum Base Metal Thickness: 0.0179 inch.
- D. Resilient Furring Channels: 3/4 inch deep members designed to reduce sound transmission. Configuration: Asymmetrical , with face attached to single flange by a slotted leg.
- E. Fasteners: Battens attached with #6 x 1-7/8" Tek fasteners. Panels attached with #8 x 3" Tek fasteners with 1/4 x 1-1/4" flat washers .

2.3 HIGH TEMPERATURE PANELS & BATTENS

- A. Proprietary Thermal Wall & Ceiling Liner Panels: Comply with the following:
 - 1. Basis of Design Product: WHP Padgenite Super HD®.
 - 2. Core: 1 inch thick, consisting of calcium silicate, reinforcing filler and natural organic fiber.
 - 3. Panel Size: 24" x 48".
 - 4. PCF Density: 77.9 PCF.
 - 5. Flex Strength: 3,558 psi.
 - 6. Continuous Service Temperature: 2,000° F.
 - 7. K-factor: 1.92 at a mean temperature of 800° F.
 - 8. Waterproofing : Two-part process on all sides.
 - 9. Location: Refer to locations noted within the Drawings.
- B. Proprietary Thermal Battens Liner Panels: Comply with the following:
 - 1. Basis of Design Product: WHP Padgenite I.
 - 2. Core: 1 inch thick, consisting of calcium silicate, reinforcing filler and natural organic fiber.
 - 3. Batten Size: 3-3/4" x 48"
 - 4. PCF Density: 46 PCF.
 - 5. Flex Strength: 800 psi.
 - 6. Continuous Service Temperature: 1,200° F.

7. K-factor: .81 at a mean temperature of 800° F.
8. Waterproofing: Two-part process on all sides

2.4 PROTECTIVE TRIM ACCESSORIES

A. Interior Galvanized Metal Trim: ASTM C 1047.

1. Material: Aluminum, Galvanized or aluminum-coated steel.
2. Shapes as follows:
 - (a) 2" x 2" Full-Height Corner Protection: Use at all outside corners within burn room areas and adjacent spaces.
 - (b) 18-gauge trim channels at all doors and windows in burn areas.

2.5 AUXILIARY MATERIALS

- A. General: Provide all auxiliary materials for installation and attachment of thermal panels in accordance with the published guidelines for "Installation of Padgenite® Panels and Accessories " provided by WHP Training Towers as the basis for installation.
- B. Galvanized Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use #8 x .Y." HWH T-2 Tek screws complying with ASTM C 954 for fastening panels to steel members.
 2. Use 2-1/4" "Tapcon" concrete anchors for attachment CMU walls.
 3. Use 5/8" S-12 screws for attaching angles.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Conduct meeting at site to examine all areas and substrates to receive the high temperature lining, with Installer and fire training prop supplier present, to verify completeness of work and coordination of installation process requirements with all disciplines.
- B. Coordinate requirements of adjacent trades and disciplines.
- C. Notify Architect of any discrepancies that would affect the proper installation of the high temperature lining material. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Proceed with installation of high temperature lining materials only upon verification that all Work of other trades adjacent to area has been completed and will not require removal and re-installation of panels.

3.2 SCHEDULE OF HIGH TEMPERATURE LINING LOCATIONS:

- A. Refer to drawings for locations of high temperature lining within Burn Room.

3.3 INSTALLATION OF HIGH TEMPERATURE WALL LINING

- A. Install wall grid system using metal furring and framing system in strict accordance with the guidelines provided by the product manufacturer.

- B. Install high temperature wall battens to framing in accordance with guidelines provided by the product manufacturer. Direct attachment of panels and battens to the structure is not permitted.
- C. Install high temperature wall panels to battens in accordance with specifications and guidelines provided by the product manufacturer.
- D. Install trims and accessories including protective wall edges and trims.

3.4 INSTALLATION OF HIGH TEMPERATURE CEILING LINING

- A. Install ceiling grid system using metal furring and framing system in strict accordance with the guidelines provided by the product manufacturer.
- B. Install high temperature ceiling battens to framing in accordance with guidelines provided by the product manufacturer. Direct attachment of panels and battens to the concrete structure is not permitted.
- C. Install high temperature ceiling panels to battens in strict accordance with specifications and guidelines provided by the product manufacturer.

3.5 INSTALLATION OF HIGH TEMPERATURE DOOR PROTECTION

- A. For Doors: Affix single layer of Padgenite material to interior face of door and frame unit. Interior lining system to wrap and protect door frame. Notch material at hardware and at hinge side to allow proper operation.

3.6 CLEANING AND PROTECTION

- A. Upon completion of Work, properly dispose of all trash, debris and materials.
- B. Clean all high temperature panels free from markings, dirt and smudges. Use only manufacturer-approved cleaning agents on panel surfaces.
- C. Protect all panels in place for the duration of construction. Remove prior to testing and startup of fire training simulators .

END OF SECTION



November 1, 2021

PBK-WLC Architects

8163 Rochester Avenue
Rancho Cucamonga, CA 91730

Attention: Jaime Moreno
Subject: San Marcos Training Tower Burn Room
Re: Addition of Padgenite Panels to Burn Room
Structural Fasteners Commentary

Dear Mr. Moreno,

Per the request of PBK-WLC, our firm was requested to review a proposed anchorage of the new Padgenite Fire Resistive Panel to the existing refractory concrete in the burn room of the San Marcos Training Tower.

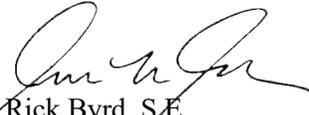
The existing refractory concrete is reinforced, has a thickness of 8", and is anchored to the existing masonry walls on vertical elevation, and the existing concrete slab above, in the vertical application. A specification of the existing refractory concrete was requested, but unavailable. The architect did provide a sample specification for refractory concrete, indicating a compressive strength of 7500 psi at 28 days. Based on this, the anchorage design will conservatively assume that the refractory concrete has a minimum compressive strength of 3000 psi in current installed condition.

The manufacturer has provided the product dead load for the demand calculation on the anchorage. The total loading of the panel system is 10 psf, with anchors spaced at 4 feet on center each way, for a maximum load of 160 lbs/anchor in tension at ceilings, and 160 lbs/ anchor in shear at wall applications. The requested anchor is a 3/8" diameter ITW Redhead Large Diameter Tapcon (LDT), galvanized, with a length of three inches. Per the ICC report (enclosed), the anchor is sufficient for the provided loading.

Installation of the 3/8 anchor shall comply with ICC ESR 3699, with special periodic inspection in compliance with section 4.4 of the ICC report. Installation torque shall be a maximum of 50 FT-LBS for manual installation as noted on page 8 of 16 of the ICC report. Impact torque wrench if used shall follow the ICC report. Minimum effective installation embedment (hef) shall be 2". Please note section 5.15 of the ICC report as it pertains to Fire Resistive construction. Manufacturer shall verify that the second exception regarding approved fire resisting materials satisfies the limitation.

Should you have any questions or require additional information please do not hesitate to contact our office.

Sincerely,


Rick Byrd, S.E.
President



DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

ADDITIONAL LISTEE:

ITW BRANDS

EVALUATION SUBJECT:

**TAPCON+ SCREW ANCHORS AND SAMMYS
 THREADED ROD ANCHORS FOR USE IN CRACKED
 AND UNCRACKED CONCRETE**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009, and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009, and 2006 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-3699 LABC and LARC Supplement](#).

Property evaluated:

Structural

2.0 USES

The 1/4-inch-, 3/8-inch-, and 1/2-inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors with Advanced Threadform Technology are used as anchorage in cracked and uncracked normalweight and lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static, wind, and seismic tension and shear loads.

The 1/2-inch-diameter (12.7 mm) Tapcon+ Screw Anchors with Advanced Threadform Technology are also used as anchorage when installed in the soffit of cracked and uncracked normalweight and sand-lightweight concrete over steel deck having a minimum specified compressive strength $f_c = 3,000$ psi (20.7 MPa) to resist static, wind, and seismic tension and shear loads.

The 1/4-inch-diameter (6.4 mm) SAMMYS Anchors for use with threaded rods are available in two head styles: the SAMMYS vertical threaded rod anchor, CCST 516; and SAMMYS horizontal threaded rod anchor, SW-CCST 516. The CCST 516 anchor is used as anchorage in cracked and uncracked normalweight and sand-lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static and wind, tension or shear loads, and seismic tension loads only. The SW-CCST 516 anchor is used as anchorage in uncracked normalweight and sand-lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static and wind shear loads only.

The anchoring system is an alternative to cast-in-place anchors described in Section 1901.3 of the 2015 IBC, Sections 1908 and 1909 of the 2012 IBC, and Sections 1911 and 1912 of the 2009 and 2006 IBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 Tapcon+ Anchors with Advanced Threadform Technology:

The Tapcon+ Anchors with Advanced Threadform Technology are manufactured from carbon steel with supplementary heat treatment. The anchors have an alternating high-low thread form on the shank and are available a variety of lengths with nominal diameters of 1/4-inch, 3/8-inch, and 1/2-inch (6.4 mm, 9.5 mm, and 12.7 mm). The Tapcon+ Screw Anchors are available with a hex washer head, and have a blue Climaseal® coating. Illustrations of anchors are provided in Figure 1.

3.2 SAMMYS Anchors for Threaded Rods:

The SAMMYS Screw Anchor is a two-piece, carbon steel threaded anchor that is comprised of the 1/4-inch-diameter (6.4 mm) Tapcon+ Screw Anchor with Advanced Threadform Technology and a 3/8-inch-16 UNC internal thread hex shaped cap. The hex shaped cap is manufactured from carbon steel alloy complying with UNS G1010 heat treated steel and has an electrodeposited coating of zinc, minimum thickness of 0.0002 inch (5 μm), in accordance with ASTM B633, SC1, Type III.

The SAMMYS Screw Anchors are available with a 2 1/2-inch (63.5 mm) length. Two models are available: SAMMYS Vertical Threaded Rod Anchor (Model No. CCST 516) and SAMMYS Horizontal Threaded Rod Anchor (Model No. SW-CCST 516). Figure 3 illustrates the SAMMYS vertical threaded rod anchor and SAMMYS

horizontal threaded rod anchor with their torque limiting installation tools. The installation tools are designed to prevent over torque conditions upon installation. The design also permits the nut driver to release from the head of the anchor once fully installed.

3.3 Concrete:

Normalweight and lightweight concrete must comply with Sections 1903 and 1905 of the IBC, as applicable.

3.4 Steel Deck Panels:

Steel deck panels must comply with the configurations in Figure 6 and have a minimum base steel thickness of 0.034 inch (0.864 mm). Steel must comply with ASTM A653 Grade 40, with a minimum yield strength of 40,000 psi (276 MPa).

4.0 DESIGN AND INSTALLATION

4.1 Strength Design:

4.1.1 General: Design strength of anchors complying with the 2015 IBC, as well as Section R301.1.3 of the 2015 IRC must be determined in accordance with ACI 318-14 Chapter 17 and this report.

Design strength of anchors complying with the 2012 IBC and Section R301.1.3 of the 2012 IRC, must be determined in accordance with ACI 318-11 Appendix D and this report.

Design strength of anchors complying with the 2009 IBC and Section R301.1.3 of the 2009 IRC must be determined in accordance with ACI 318-08 Appendix D and this report.

Design strength of anchors complying with the 2006 IBC and Section R301.1.3 of the 2006 IRC must be determined in accordance with ACI 318-05 Appendix D and this report.

Design parameters are provided in Tables 1, 2, 3 and 5 and references to ACI 318 are based on the 2015 IBC (ACI 318-14) and 2012 IBC (ACI 318-11) unless noted otherwise in Sections 4.1.2 through 4.1.12 of this report. The strength design must comply with ACI 318-14 17.3.1 or ACI 318-11 D.4.1, except as required in ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable.

Strength reduction factors, ϕ , as given in ACI 318-14 17.3.3 or ACI 318-11 Section D.4.3, as applicable, and noted in Tables 2, 3, and 5 must be used for load combinations calculated in accordance with Section 1605.2 of the IBC, Section 5.3 of ACI 318-14 or Section 9.2 of ACI 318-11, as applicable. Strength reduction factors as given in ACI 318-11 D.4.4 must be used for load combinations set forth in ACI 318-11 Appendix C.

The value of f_c used in the calculations must be limited to a maximum of 8,000 psi (55.2 MPa), in accordance with ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable.

4.1.2 Requirements for Static Steel Strength in Tension, N_{sa} : The nominal static steel strength of a single anchor in tension is calculated in accordance with ACI 318-14 17.4.1.2 or ACI 318 D.5.1.2, as applicable. The N_{sa} values of a single anchor are given in Table 2 of this report. Strength reduction factors, ϕ , corresponding to brittle steel elements as defined in ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, and provided in Table 2, must be used.

4.1.3 Requirements for Static Concrete Breakout Strength in Tension, N_{cb} or N_{cbg} : The nominal static concrete breakout strength for a single anchor or group of anchors in tension, N_{cb} or N_{cbg} , must be calculated in

accordance with ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, with modifications as described in this section. The basic concrete breakout strength in tension, N_b , must be calculated in accordance with ACI 318-14 17.4.2.2 or ACI 318-11 D.5.2.2, as applicable, using the values of h_{ef} and k_{cr} as given in Table 2. The nominal concrete breakout strength in tension in regions of concrete where analysis indicates no cracking at service loads in accordance with ACI 318-14 17.4.2.6 or ACI 318-11 D.5.2.6, as applicable, must be calculated using the values of k_{uncr} as given in Table 2 of this report with $\psi_{c,N} = 1.0$.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete breakout strength is not required.

4.1.4 Requirements for Static Pullout Strength in Tension, N_p : The nominal pullout strength of a single anchor in tension in accordance with ACI 318-14 17.4.3.1 and 17.4.3.2 or ACI 318-11 D.5.3.1 and D.5.3.2, as applicable, in cracked and uncracked concrete, $N_{p,cr}$ and $N_{p,uncr}$, respectively, is given in Table 2 of this report. For all design cases $\Psi_{c,p} = 1.0$. In accordance with ACI 318-14 17.4.3 or ACI 318-11 D.5.3, as applicable, the nominal pullout strength in cracked concrete may be adjusted for concrete strengths according to Eq-1:

$$N_{p,f'_c} = N_{p,cr} \left(\frac{f'_c}{2,500} \right)^n \quad (\text{lb,psi}) \quad (\text{Eq-1})$$

$$N_{p,f'_c} = N_{p,cr} \left(\frac{f'_c}{17.2} \right)^n \quad (\text{N,MPa})$$

where f'_c is the specified compressive strength and n is the factor defining the influence of concrete strength on the pullout strength. For the $3/8$ -inch-diameter anchor in cracked concrete, n is 0.12. For all other diameters, n is 0.5.

In regions where analysis indicates no cracking in accordance with ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, the nominal pullout strength in tension may be adjusted for concrete strengths according to Eq-2:

$$N_{p,f'_c} = N_{p,uncr} \left(\frac{f'_c}{2,500} \right)^n \quad (\text{lb,psi}) \quad (\text{Eq-2})$$

$$N_{p,f'_c} = N_{p,uncr} \left(\frac{f'_c}{17.2} \right)^n \quad (\text{N,MPa})$$

where f'_c is the specified compressive strength and n is the factor defining the influence of concrete strength on the pullout strength. For all diameters, n is 0.5.

Where values for $N_{p,cr}$ or $N_{p,uncr}$ are not provided in Table 2, the pullout strength in tension need not be evaluated.

The nominal pullout strength in cracked concrete of the $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchor installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, is given in Table 5. In accordance with ACI 318-14 17.4.3.2 or ACI 318 D.5.3.2, as applicable, the nominal pullout strength in cracked concrete must be calculated in accordance with Eq-1, whereby the value of $N_{p,deck,cr}$ must be substituted for $N_{p,cr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator. In regions where analysis indicates no cracking in accordance with ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, the nominal strength in uncracked concrete must be calculated according to Eq-2, whereby the value of $N_{p,deck,uncr}$ must be

substituted for $N_{p,uncr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator.

4.1.5 Requirements for Static Steel Strength in Shear, V_{sa} : The nominal steel strength in shear, V_{sa} , of a single anchor in accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, is given in Table 3 of this report and must be used in lieu of the values derived by calculation from ACI 318-14 Eq. 17.5.1.2b or ACI 318-11, Eq. D-29, as applicable. Strength reduction factors, ϕ , corresponding to brittle steel elements as defined in ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, and provided in Table 3, must be used.

The nominal shear strength $V_{sa,deck}$, of anchors installed in the soffit of sand-lightweight or normalweight concrete filled steel deck floor and roof assemblies, as shown in Figure 6, is given in Table 5.

4.1.6 Requirements for Static Concrete Breakout Strength of Anchor in Shear, V_{cb} or V_{cbg} : The nominal static concrete breakout strength of a single anchor or group of anchors in shear, V_{cb} or V_{cbg} , must be calculated in accordance with ACI 318-14 17.5.2 or ACI 318-11 D.6.2, as applicable, with modifications as described in this section. The basic concrete breakout strength of a single anchor in shear, V_b , must be calculated in accordance with ACI 318-14 17.5.2.2 or ACI 318-11 D.6.2.2, as applicable, based on the values provided in Table 3. The value of l_e used in ACI 318-14 Eq. 17.5.2.2a or ACI 318-11 Eq. D-33, as applicable, must be taken as no greater than the lesser of h_{ef} or $8d_a$.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete breakout strength in shear is not required.

4.1.7 Requirements for Static Concrete Pryout Strength in Shear, V_{cp} or V_{cpg} : The nominal static concrete pryout strength of a single anchor or group of anchors in shear, V_{cp} or V_{cpg} , must be calculated in accordance with ACI 318-14 17.5.3 or ACI 318-11 D.6.3, as applicable, using the value of K_{cp} described in Table 3, and the values of N_{cb} or N_{cbg} as calculated in Section 4.1.3 of this report.

For $1/2$ inch (12.7 mm) diameter Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete pryout strength in shear is not required.

4.1.8 Requirements for Seismic Design:

4.1.8.1 General: For load combinations including seismic, the design must be performed according to ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Modifications to ACI 318-14 17.2.3 shall be applied under Section 1905.1.8 of the 2015 IBC. For the 2012 IBC, Section 1905.1.9 must be omitted. Modifications to ACI 318 (-08, -05) D.3.3 must be applied under Section 1908.1.9 of the 2009 IBC or Section 1908.1.16 of the 2006 IBC, as applicable.

The anchors comply with ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, as brittle steel elements and must be designed in accordance with ACI 318-14 17.2.3.4, 17.2.3.5, 17.2.3.6 or 17.2.3.7; ACI 318-11 D.3.3.4, D.3.3.5, D.3.3.6 or D.3.3.7; or ACI 318-08 D.3.3.4, D.3.3.5 or D.3.3.6; or ACI 318-05 D.3.3.4 or D.3.3.5, as applicable.

The $1/4$ -inch-, $3/8$ -inch-, and $1/2$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors may be installed in regions designated as IBC Seismic Design Categories A through F.

The $1/4$ -inch (6.4 mm) SAMMYS vertical threaded rod anchors (CCST 516) are limited to seismic tension loads only, and seismic shear loads are beyond the scope of this report. The $1/4$ -inch (6.4 mm) SAMMYS horizontal threaded rod anchors (SW-CCST 516) are limited to static shear loads only, and seismic tension or shear loads are beyond the scope of this report. The SAMMYS vertical threaded rod anchors (CCST 516) may be installed in regions designated as IBC Seismic Design Categories A through F.

4.1.8.2 Seismic Tension: The nominal steel strength and nominal concrete breakout strength for anchors in tension must be calculated according to ACI 318-14 17.4.1 and 17.4.2 or ACI 318-11 D.5.1 and D.5.2, respectively, as applicable, as described in Sections 4.1.2 and 4.1.3 of this report. In accordance with ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the value for nominal pullout strength in tension for seismic loads, $N_{p,eq}$ or $N_{p,deck,cr}$, given in Table 2 and Table 5 of this report, must be used in lieu of N_p . The values of $N_{p,eq}$ or $N_{p,deck,cr}$ must be adjusted for the concrete strength in accordance with Eq-2 and Section 4.1.4 whereby the value of $N_{p,deck,cr}$ must be substituted for $N_{p,cr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator. If no values for $N_{p,eq}$ are given in Table 2 or Table 5, the static design strength values govern.

4.1.8.3 Seismic Shear: The nominal concrete breakout strength and pryout strength for anchors in shear must be calculated according to ACI 318-14 17.5.2 and 17.5.3 or ACI 318-11 D.6.2 and D.6.3, respectively, as applicable, as described in Sections 4.1.6 and 4.1.7 of this report. In accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, the value for nominal steel strength in shear for seismic loads, $V_{sa,eq}$, or $V_{sa,deck}$, given in Tables 3 or 5 of this report, must be used in lieu of V_{sa} , as applicable.

4.1.9 Requirements for Interaction of Tensile and Shear Forces: For designs that include combined tension and shear, the interaction of tension and shear loads must be calculated in accordance with ACI 318-14 17.6 or ACI 318-11 D.7, as applicable. For the Sammys anchors, influence of bending on tension values when loaded in shear must be considered.

4.1.10 Requirements for Critical Edge Distance: In applications where $c < c_{ac}$ and supplemental reinforcement to control splitting of the concrete is not present, the concrete breakout strength in tension for uncracked concrete, calculated in accordance with ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, must be further multiplied by the factor $\psi_{cp,N}$ given by Eq-3:

$$\psi_{cp,N} = \frac{c}{c_{ac}} \quad (\text{Eq-3})$$

whereby the factor $\psi_{cp,N}$ need not be taken as less than $\frac{1.5h_{ef}}{c_{ac}}$. For all other cases, $\psi_{cp,N} = 1.0$. In lieu of ACI 318-14 17.7.6 or ACI 318-11 D.8.6, as applicable, the values for the critical edge distance, c_{ac} , must be taken from Table 1.

4.1.11 Requirements for Minimum Member Thickness, Minimum Anchor Spacing and Minimum Edge Distance: In lieu of ACI 318-14 17.7.1 and 17.7.3 or ACI 318-11 D.8.1 and D.8.3, respectively, as applicable, values of s_{min} and c_{min} as given in Table 1 of this report must be used. In lieu of ACI 318-14 17.7.5 or ACI 318-11 D.8.5, minimum concrete thickness h_{min} as given in Table 1 of this report must be used.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, the anchors must be installed in accordance with Figure 6 and must have an axial spacing along the flute equal to the greater of $3h_{ef}$ or 1.5 times the flute width.

4.1.12 Lightweight Concrete: For the use of anchors in lightweight concrete, the modification factor λ_a equal to 0.8λ is applied to all values of $\sqrt{f'_c}$ affecting N_n and V_n .

For ACI 318-14 (2015 IBC), ACI 318-11 (2012 IBC) and ACI 318-08 (2009 IBC), λ shall be determined in accordance with the corresponding version of ACI 318.

For ACI 318-05 (2006 IBC), λ shall be taken as 0.75 for all lightweight concrete and 0.85 for sand-lightweight concrete. Linear interpolation shall be permitted if partial sand replacement is used. In addition, the pullout strengths $N_{p,uncr}$, $N_{p,cr}$ and $N_{p,eq}$ shall be multiplied by the modification factor, λ_a , as applicable.

For anchors installed in the soffit of sand-lightweight concrete-filled steel deck and floor and roof assemblies, further reduction of the pullout values provided in this report is not required.

4.2 Allowable Stress Design:

4.2.1 General: Design values for use with allowable stress design (working stress design) load combinations calculated in accordance with Section 1605.3 of the IBC, must be established as follows:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \quad (\text{Eq-4})$$

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \quad (\text{Eq-5})$$

where:

$T_{allowable, ASD}$ = Allowable tension load (lbf or kN).

$V_{allowable, ASD}$ = Allowable tension load (lbf or kN).

ϕN_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05 Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report, as applicable (lbf or kN).

ϕV_n = Lowest design strength of an anchor or anchor group in shear as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05

Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report, as applicable (lbf or kN).

α = Conversion factor calculated as a weighted average of the load factors for the controlling load combination. In addition, α must include all applicable factors to account for nonductile failure modes and required over-strength.

Limits on edge distance, anchor spacing and member thickness as given in Section 4.1.11 of this report must apply. An illustrative example of allowable stress design values is shown in Table 4.

4.2.2 Interaction of Tensile and Shear Forces: The interaction must be calculated and consistent with ACI 318-14 17.6 or ACI 318 (-11, -08, -05) D.7, as applicable, as follows:

If $T_{applied} \leq 0.2 T_{allowable,ASD}$, the full allowable load in shear $V_{allowable,ASD}$ shall be permitted.

If $V_{applied} \leq 0.2 V_{allowable,ASD}$, the full allowable load in tension $T_{allowable,ASD}$ shall be permitted.

For all other cases:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \leq 1.2 \quad (\text{Eq-6})$$

4.3 Installation:

Installation parameters are provided in Table 1 and Figures 4 and 6 of this report. The Tapcon+ Screw Anchors and SAMMYS Anchors must be installed in accordance with the manufacturer's published instructions and this report. In case of conflict, this report governs. Anchor locations must comply with this report and the plans and specifications approved by the code official.

4.3.1 Tapcon+ Screw Anchors with Advanced Threadform Technology: $1/4$ -inch-, $3/8$ -inch-, and $1/2$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors must be installed according to ITW's published instructions and this report. For the $1/4$ -inch-diameter (6.4 mm) anchor, the holes must be predrilled in concrete with a carbide-tipped drill bit complying with ANSI B212.15-1994 or a Tapcon+ carbide-tipped drill bit, supplied by ITW. For the $3/8$ -inch- and $1/2$ -inch-diameter (9.5 mm and 12.7 mm) anchors, the holes must be predrilled in concrete with a carbide-tipped drill bit complying with ANSI B212.15-1994. The hole must be drilled to the specified minimum hole depth, h_{hole} , in accordance with Table 1. Before anchor installation, dust and other debris must be removed by use of a vacuum or compressed air. The anchors must then be installed through the attachment into the hole, in accordance with ITW's instructions, to the specified nominal embedment depth using a powered impact wrench or manual torque wrench until the proper embedment depth is obtained. The maximum impact wrench torque and maximum installation torque for the manual torque wrench must be in accordance with Table 1. The Tapcon+ Screw Anchors may be loosened by a maximum of one turn and retightened with a manual torque wrench or powered impact wrench to facilitate fixture attachment or realignment. Complete removal and reinstallation of the anchor is not allowed.

For installation of the $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchor in the soffit of concrete on steel deck assemblies, the hole diameter in the steel deck must

not exceed the diameter of the hole in the concrete by more than $\frac{1}{8}$ inch (3.2 mm). For member thickness and edge distance restrictions for installations into the soffit of concrete on steel deck assemblies, see Figure 6.

4.3.2 SAMMYS Anchors for Threaded Rod: The SAMMYS Anchors must be installed according to ITW's published instructions and this report. Holes must be predrilled in concrete with a Tapcon carbide-tipped drill bit complying with ANSI B212.15-1994, supplied by ITW. The hole must be drilled to the specified nominal embedment depth plus a minimum of $\frac{1}{4}$ inch (6.4 mm). Before anchor installation, dust and other debris must be removed by use of a vacuum or compressed air. The anchors must then be installed into the hole, in accordance with ITW's instructions, to the specified nominal embedment depth using a powered impact wrench in conjunction with the ITW torque limiting nut driver until the proper embedment depth is obtained. Removal and reinstallation of the anchor is not allowed.

4.4 Special Inspection:

Periodic special inspection is required in accordance with Section 1705.1.1 and Table 1705.3 of the 2015 IBC and 2012 IBC; or Section 1704.15 and Table 1704.4 of the 2009 IBC; or Section 1704.13 of the 2006 IBC, as applicable. The special inspector must make periodic inspections during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, hole dimensions, anchor spacing, edge distances, concrete thickness, anchor embedment, drill bit type and size, hole cleaning procedures, installation torque, and adherence to the manufacturer's published installation instructions and the conditions of this report (in case of conflict, this report governs). The special inspector must be present as often as required in accordance with the "statement of special inspection."

5.0 CONDITIONS OF USE

The Tapcon+ Screw Anchors and SAMMYS Anchors described in this report are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Anchor sizes, dimensions, embedment, and installation are as set forth in this report.
- 5.2 The anchors must be installed in accordance with the manufacturer's published installation instructions and this report. In case of conflict, this report governs.
- 5.3 The $\frac{1}{4}$ -inch-, $\frac{3}{8}$ -inch-, and $\frac{1}{2}$ -inch-diameter (6.4 mm, 9.5 mm and 12.7 mm) anchors must be used in cracked and uncracked normalweight concrete and lightweight concrete having a specified compressive strength, f_c , of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).
- 5.4 The $\frac{1}{2}$ -inch-diameter (12.7 mm) anchor may be used in cracked and uncracked normalweight or sand-lightweight concrete over metal deck having a minimum specified compressive strength, f_c , of 3,000 psi (20.7 MPa).
- 5.5 The values of f_c used for calculation purposes must not exceed 8,000 psi (55.1 MPa).
- 5.6 The concrete shall have attained its minimum design strength prior to installation of the anchors.
- 5.7 Strength design values must be established in accordance with Section 4.1 of this report.
- 5.8 Allowable stress design values must be established in accordance with Section 4.2 of this report.
- 5.9 Anchor spacing, edge distance, and minimum concrete thickness must comply with Section 4.1.11, Table 1, and Figure 6 of this report.
- 5.10 Reported values for the SAMMYS Anchors for Threaded Rod do not consider the steel element threaded into the anchor, which must be verified by the design professional. SAMMYS Anchors must be installed directly into the concrete, without the use of a baseplate.
- 5.11 Prior to installation, calculations and details demonstrating compliance with this report must be submitted to the code official for approval. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.12 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under these conditions is beyond the scope of this report.
- 5.13 The $\frac{1}{4}$ -inch-, $\frac{3}{8}$ -inch-, and $\frac{1}{2}$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors may be used to resist short-term loading due to wind forces and for seismic load combinations in locations designated as Seismic Design Categories A through F under the IBC, subject to the conditions of this report.
- 5.14 The $\frac{1}{4}$ -inch-diameter (6.4 mm) SAMMYS Anchors may be used to resist short-term loading due to wind forces and seismic tension loads only in locations designated as Seismic Design Categories A through F under the IBC, subject to the conditions of this report.
- 5.15 Anchors are not permitted to support fire-resistance-rated construction. Where not otherwise prohibited by the code, anchors are permitted for installation in fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:
 - Anchors are used to resist wind or seismic forces only.
 - Anchors that support a fire-resistance-rated envelope or a fire-resistance-rated membrane, are protected by approved fire-resistance-rated materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
 - Anchors are used to support nonstructural elements.
- 5.16 The anchors have been evaluated for reliability against brittle failure and found to be not significantly sensitive to stress-induced hydrogen-embrittlement.
- 5.17 The design of anchor groups in accordance with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, is valid for screw anchors with a thread length of at least 80 percent of the nominal embedment depth. Anchors with a thread length less than 80 percent of the nominal embedment depth shall be designed as single anchors.

- 5.18 Use of anchors must be limited to dry, interior locations.
- 5.19 Special inspection must be provided in accordance with Section 4.4 of the report.
- 5.20 Anchors are manufactured in the U.S.A. under an approved quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193), dated October 2015; and quality-control documentation.

7.0 IDENTIFICATION

The Tapcon+ Screw Anchors and SAMMYS Anchors are identified by packaging labeled with the manufacturer’s name (ITW Red Head, ITW Buildex, or ITW Brands), contact information, anchor name, anchor size, and evaluation report number (ESR-3699). The Red Head logo or “BX” logo, and a length identification code letter are stamped on the head of each anchor. See the length identification system illustrated in Figure 2 of this report.

- 7.1 The report holder’s contact information is the following:

ITW RED HEAD
ITW BUILDEX
700 HIGH GROVE BOULEVARD
GLENDALE HEIGHTS, ILLINOIS 60139
(800) 848-5611
www.itw-redhead.com
techsupport@itwccna.com

- 7.2 The Additional Listee’s and manufacturing locations contact information is the following:

ITW BRANDS
955 NATIONAL PARKWAY, SUITE 95500
SCHAUMBURG, ILLINOIS 60173
(877) 489-2726
www.itwbrands.com

TABLE A—PRODUCT IDENTIFICATION CROSS REFERENCE BY MANUFACTURER

PRODUCT REFERENCE PER ICC-ES ESR-3699	ITW RED HEAD	ITW BUILDEX	ITW BRANDS
1/4" SAMMYS for Vertical Rod	Not applicable	1/4" SAMMYS for Vertical Rod Part No. CCST 516	Not applicable
1/4" SAMMYS for Horizontal Rod	Not applicable	1/4" SAMMYS for Horizontal Rod Part No. SW-CCST 516	Not applicable
1/4" Tapcon+ Anchor	1/4" Tapcon+ Anchor	Not applicable	Buildex 5/16" Tapcon+ Anchor
3/8" Tapcon+ Anchor	3/8" Tapcon+ Anchor	Not applicable	Buildex 3/8" Tapcon+ Anchor
1/2" Tapcon+ Anchor	1/2" Tapcon+ Anchor	Not applicable	Buildex 1/2" Tapcon+ Anchor



FIGURE 1—TAPCON+ SCREW ANCHOR WITH ADVANCED THREADFORM TECHNOLOGY

LENGTH MARKING ON ANCHOR HEAD			A	B	C	D	E	F	G	H	I	J
Length of anchor (inches)	From	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Up to, but not including	1½	2	2½	3	3½	4	4½	5	5½	6	6½

For SI: 1 inch = 25.4 mm.

FIGURE 2—LENGTH IDENTIFICATION SYSTEM



SAMMYS Vertical Threaded Rod Anchor (Model No. CCST 516) with torque-limiting nut driver (#14 Black Nut Driver)

SAMMYS Horizontal Threaded Rod Anchor (Model No. SW-CCST 516) with torque-limiting nut driver (#14 SW Red Nut Driver)

FIGURE 3—SAMMYS SCREW ANCHORS FOR THREADED ROD

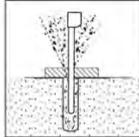


INSTALLATION INSTRUCTIONS FOR TAPCON+ SCREW ANCHORS

Installation Steps for Concrete, Lightweight Concrete and Metal Deck



1. Using a carbide drill bit, drill a hole at least 1/4" deeper than anchor embedment.



2. Clean hole with pressurized air or vacuum to remove any excess dust/debris.



3. Using an impact or manual wrench, insert anchor into hole and tighten anchor until fully seated.

ANCHOR DIAMETER (inch)	ANSI DRILL BIT DIAMETER (inch) ¹	ANCHOR HEAD (SOCKET SIZE) DIAMETER (inch)	ANCHOR HEAD HEIGHT (inch)	WASHER DIAMETER (inch)	MANUAL WRENCH MAX TORQUE ²	IMPACT WRENCH MAX TORQUE RATING
1/4 (ITW Red Head Anchor)	1/4	3/8	0.24	1/2	20 FT LBS	115 FT LBS
5/16 (ITW Brands Anchor)	1/4	3/8	0.24	1/2	20 FT LBS	115 FT LBS
3/8	3/8	9/16	0.35	13/16	50 FT LBS	200 FT LBS
1/2	1/2	3/4	0.45	1	70 FT LBS	345 FT LBS

¹ A 1/4-inch Tapcon+ drill bit may also be used for installation of the 1/4-inch anchor.

² For manual installation, use a torque wrench to verify that the maximum installation torque has not been exceeded.



Installation Steps for Concrete

1. Using a 1/4-inch Tapcon+ drill bit, drill a hole at least 1/4-inch deeper than anchor embedment.
2. Clean hole with compressed air or vacuum to remove any excess dust/debris.
3. Insert appropriate torque-limiting nut driver into the drill. See chart below.
4. Insert the anchor into the nut driver, position the anchor into hole and tighten anchor until nut driver spins free on cap of anchor.

Anchor Model	Torque-Limiting Nut Driver (Color)	Installation Orientation	Rod Size (inch)
CCST 516	#14 (Black)	Vertical	3/8
SW-CCST 516	#14 SW (Red)	Horizontal	3/8

FIGURE 4—INSTALLATION INSTRUCTIONS FOR TAPCON+ SCREW ANCHOR AND SAMMYS THREADED ROD ANCHOR

TABLE 1—INSTALLATION INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS^{1,6}

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)						
			1/4		1/4	3/8	1/2		
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head	Hex Head	Hex Head		
Nominal Outside diameter (Shank)	d_a (d_o) ³	in.	0.25		0.25	0.38	0.50		
Nominal Outside diameter (threads)	—	in.	0.33		0.33	0.46	0.59		
Drill bit specification	d_{bit}	in.	1/4 Tapcon+ Bit		1/4 Tapcon+ Bit	1/4 ANSI Bit	3/8 ANSI Bit	1/2 ANSI Bit	
Minimum base plate clearance hole diameter	d_h	in.	Not applicable ²		3/8	1/2	5/8		
Maximum installation torque ⁵	$T_{inst, max}$	ft-lbf	Not applicable ⁴		20	50	70		
Maximum Impact Wrench Torque Rating	$T_{impact, max}$	ft-lbf	Not applicable ⁴		115	200	345		
Effective embedment depth	h_{ef}	in.	1.67		1.45	1.78	1.32	2.17	3.02
Minimum nominal embedment depth ⁶	h_{nom}	in.	2 1/4		2	2 1/2	2	3	4
Minimum hole depth	h_{hole}	in.	2 1/2		2 1/4	2 3/4	2 1/4	3 1/4	4 1/4
Minimum concrete member thickness	h_{min}	in.	4		4	4	4	6	
Critical edge distance	c_{ac}	in.	2 1/2		2 1/2	4 1/2	3	4	5
Minimum edge distance	c_{min}	in.	1 1/2		1 1/2	1 1/2	2 1/2	1 3/4	2 1/2
Minimum spacing	s_{min}	in.	3		3	3	3	3 1/2	3

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318 Appendix D, as applicable.

²The Sammys Anchor is installed without a base plate, directly into the concrete.

³For the 2006 IBC, d_o replaced d_a .

⁴Installation must be performed with an ITW torque limiting nut driver, as applicable. See Section 4.3 for additional information.

⁵ $T_{inst, max}$ applies to installations using a calibrated torque wrench.

⁶For the 3/8-inch-, and 1/2-inch-diameter Tapcon+ anchors, the design of anchor groups in accordance with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, is only valid for screw anchors with a thread length of at least 80 percent of the nominal embedment depth. Anchors with a thread length less than 80 percent of the nominal embedment depth shall be designed as single anchors.

TABLE 2—TENSION STRENGTH DESIGN INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS¹

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)							
			¹ / ₄		¹ / ₄	³ / ₈	¹ / ₂			
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head		Hex Head	Hex Head		
Drill bit specification		in.	¹ / ₄ Tapcon+ Bit		¹ / ₄ Tapcon+ Bit	¹ / ₄ ANSI Bit	³ / ₈ ANSI Bit	¹ / ₂ ANSI Bit		
Anchor category	1, 2 or 3	—	1		1	2	1	1		
Effective embedment depth	h_{ef}	in.	1.45 ⁶		1.45		1.78	1.32	2.17	3.02
Minimum concrete member thickness	h_{min}	in.	4		4		4	4	6	
Critical edge distance	c_{ac}	in.	2 ¹ / ₂		2 ¹ / ₂		4 ¹ / ₂	3	4	5
Data for Steel Strength in Tension										
Minimum specified yield strength	f_y	psi	Not applicable		100,000		100,000	100,000		
Minimum specified ultimate strength	$f_{uta} (f_{ut})^5$	psi	Not applicable		125,000		125,000	125,000		
Effective tensile stress area	A_{se}	in ²	Not applicable		0.0470		0.098	0.1850		
Steel strength in tension	N_{sa}	lbf	1,822 ⁷		5,900		12,250	23,125		
Strength reduction factor ϕ for tension, steel failure modes ²	ϕ_{sa}	—	0.65		0.65		0.65	0.65		
Data for Concrete Breakout Strength in Tension										
Effectiveness factor - uncracked concrete	k_{uncr}	—	24		24		27	30		
Effectiveness factor - cracked concrete	k_{cr}	—	17		17		17	17		
Modification factor for cracked and uncracked concrete ³	$\psi_{c,N} (\psi_3)^5$	—	1.0		1.0		1.0	1.0		
Strength reduction factor ϕ for tension, concrete failure modes, Condition B ³	ϕ_{cb}	—	0.65		0.65	0.55	0.65	0.65		
Data for Pullout Strength in Tension										
Pullout strength, uncracked concrete	$N_{p,uncr}$	lbf	2,107		2,107		See Footnote 4	See Footnote 4		
Pullout strength, cracked concrete	$N_{p,cr}$	lbf	857		857		1,837	See Footnote 4		
Pullout strength for seismic loads	$N_{p,eq}$	lbf	857		857		1,677	See Footnote 4		
Strength reduction factor ϕ for tension, pullout failure modes, Condition B ³	ϕ_p	—	0.65		0.65	0.55	0.65	See Footnote 4		
Additional Anchor Data										
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lbf /in	385,000		385,000		800,000	800,000		
Axial stiffness in service load range in cracked concrete	β_{cr}	lbf /in	225,000		225,000		365,000	365,000		

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

²The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318 Section 9.2, as applicable, are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(b).

³The tabulated value of ϕ_{cb} and ϕ_{cp} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.

⁴Pullout resistance does not govern design and does not need to be considered.

⁵The notation in parentheses is for the 2006 IBC.

⁶For calculation only. For actual h_{ef} see Table 1.

⁷For the strength between the threaded cap and anchor head.

TABLE 3—SHEAR STRENGTH DESIGN INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS¹

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)							
			$\frac{1}{4}$		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$			
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head		Hex Head	Hex Head		
Drill bit specification		in.	$\frac{1}{4}$ Tapcon+ Bit		$\frac{1}{4}$ Tapcon+ Bit	$\frac{1}{4}$ ANSI Bit	$\frac{3}{8}$ ANSI Bit	$\frac{1}{2}$ ANSI Bit		
Anchor category	1, 2 or 3	—	1		1	2	1	1		
Minimum effective embedment depth	h_{ef}	in.	1.45 ⁶		1.45		1.78	1.32	2.17	3.02
Minimum concrete member thickness	h_{min}	in.	4		4		4	4	6	
Critical edge distance	c_{ac}	in.	2 $\frac{1}{2}$		2 $\frac{1}{2}$		4 $\frac{1}{2}$	3	4	5
Data for Steel Strengths in Shear										
Minimum specified yield strength	f_y	psi	Not applicable		100,000	100,000	100,000	100,000		
Minimum specified ultimate strength	$f_{uta} (f_{ut})^4$	psi	Not applicable		125,000	125,000	125,000	125,000		
Effective shear stress area	A_{se}	in ²	Not applicable		0.047	0.098	0.185	0.185		
Steel strength in shear - static	V_{sa}	lbf	905 ⁷		2,045	3,621	12,610	12,610		
Steel strength in shear - seismic	$V_{sa,eq}$		Not applicable ⁵		1,350	2,920	9,300	9,300		
Strength reduction factor ϕ for shear, steel failure modes ²	ϕ_{sa}	—	0.60		0.60	0.60	0.60	0.60		
Data for Concrete Breakout and Concrete Pryout Strengths in Shear										
Nominal Outside diameter (shank)	$d_a (d_o)^4$	in.	0.25		0.25	0.38	0.50			
Load bearing length of anchor	ℓ_e	—	1.67		1.45	1.78	1.32	2.17	3.02	
Coefficient for Pryout Strength	κ_{cp}	—	1.0		1.0	1.0	1.0		2.0	
Strength reduction factor for shear, concrete breakout ³	ϕ_{cb}	—	0.70		0.70	0.70	0.70			
Strength reduction factor for shear, pryout ³	ϕ_{cp}	—	0.70		0.70	0.70	0.70			

For **SI**: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

²The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(b).

³The tabulated value of ϕ_{cb} and ϕ_{cp} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.

⁴The notation in parentheses is for the 2006 IBC.

⁵The SAMMYS anchors have not been evaluated for seismic shear design under this report.

⁶For calculation only. For actual h_{ef} see Table 1.

⁷For the strength between the threaded cap and anchor head.

TABLE 4—EXAMPLE ALLOWABLE STRESS DESIGN TENSION VALUES FOR ILLUSTRATIVE PURPOSES FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS ^{1,2,3,4,5,6,7,8,9}

NOMINAL ANCHOR DIAMETER (inch)	NOMINAL EMBEDMENT DEPTH (inches)	EFFECTIVE EMBEDMENT DEPTH (inches)	ALLOWABLE TENSION LOAD (pounds)
1/4 SAMMYS	2.25	1.45 ¹⁰	800
1/4	2.00	1.45	920
3/8	2.50	1.78	1,335
1/2	2.00	1.32	800
	3.00	2.17	1,685
	4.00	3.02	2,765

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 0.006895 MPa.

¹Single anchor with static tension load only.

²Concrete determined to remain uncracked for the life of the anchorage.

³Load combination from ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, (no seismic loading).

⁴30 percent dead load and 70 percent live load, controlling load combination 1.2D + 1.6L.

⁵Calculation of weighted average for $\alpha = 0.3 * 1.2 + 0.7 * 1.6 = 1.48$.

⁶Normalweight concrete, $f'_c = 2,500$ psi

⁷ $C_{a1} = C_{a2} > C_{ac}$.

⁸ $h \geq h_{min}$.

⁹Condition B where supplementary reinforcement in accordance with ACI 318-14 Section 17.3.4 or ACI 318-11 Section D.4.4, as applicable, is not provided.

¹⁰For calculation only. For actual h_{ef} see Table 1.

Illustrative Procedure to Calculate Allowable Stress Design Tension Value:

Tapcon+ Screw Anchor 1/2-inch diameter, using an embedment of 4-inches, assuming the conditions given in Table 4.

	PROCEDURE	CALCULATION
Step 1	Calculate steel strength of a single anchor in tension per ACI 318-14 17.4.1.2, ACI 318-11 D 5.1.2, Table 2 of this report:	$\phi N_{sa} = \phi N_{sa}$ $= 0.70 * 23,125$ = 15,031 lbs steel strength
Step 2	Calculate concrete breakout strength of a single anchor in tension per ACI 318-14 17.4.2.2, ACI 318-11 D 5.2.2, Table 2 of this report:	$N_b = k_{uncr} \sqrt{f'_c} h_{ef}^{1.5}$ $= 24 * \sqrt{2,500} * 3.02^{1.5}$ $= 6,298$ lbs $\phi N_{cb} = \phi A_{NC} / A_{NCO} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b$ $= 0.65 * 1.0 * 1.0 * 1.0 * 1.0 * 6,298$ $= 0.65 * 6,298$ = 4,093 lbs concrete breakout strength
Step 3	Calculate pullout strength per Table 2 of this report:	$\phi N_{pn} = \phi N_{p,uncr} \psi_{c,P}$ n/a – pullout strength does not control (see Table 2, footnote 4)
Step 4	Determine controlling resistance strength in tension per ACI 318-14 17.3.1.1 and 17.3.1.2, ACI 318-11 D 4.1.1 and D 4.1.2:	= 4,093 lbs controlling resistance (concrete)
Step 5	Calculate allowable stress design conversion factor for loading condition per ACI 318-14 Section 5.3, or ACI 318-11 Section 9.2:	$\alpha = 1.2D + 1.6L$ $= 1.2(0.3) + 1.6(0.7)$ = 1.48
Step 6	Calculate allowable stress design value per Section 4.2 of this report:	$T_{allowable, ASD} = \phi N_n / \alpha$ $= 4,093 / 1.48$ = 2,765 lbs allowable stress design

FIGURE 5—EXAMPLE DESIGN CALCULATION

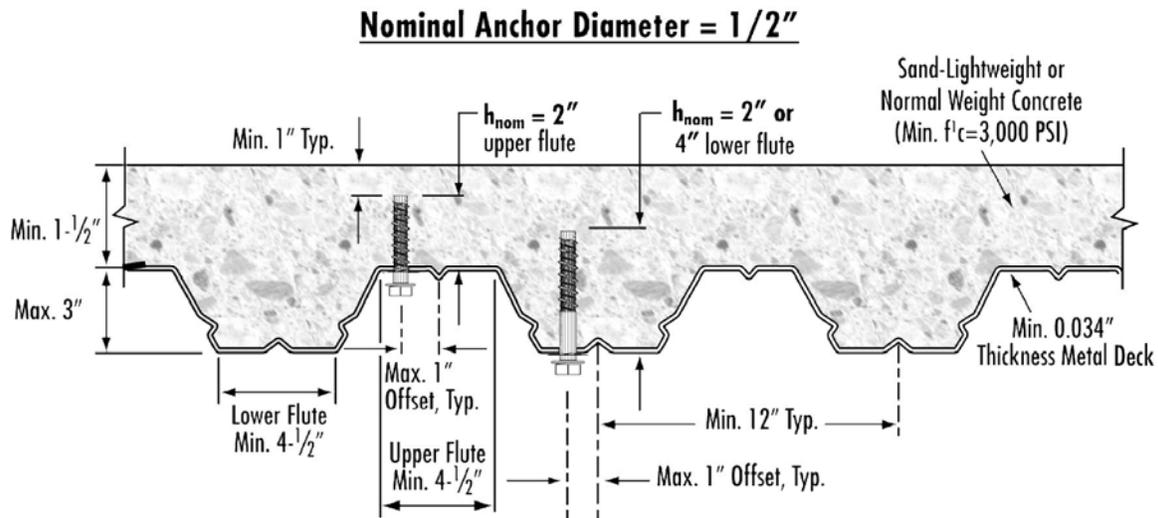


FIGURE 6—TAPCON+ SCREW ANCHOR LOCATED IN THE SOFFIT OF CONCRETE OVER STEEL DECK FLOOR AND ROOF ASSEMBLIES
(1 inch = 25.4 mm)

TABLE 5—TAPCON+ SCREW ANCHOR DESIGN INFORMATION FOR ANCHORS LOCATED IN THE SOFFIT OF CONCRETE OVER STEEL DECK FLOOR AND ROOF ASSEMBLIES^{1,2,3,4,5}

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)	
			1/2	
Location of installation	—	—	Lower Flute	Upper Flute
Minimum hole depth	h_{hole}	in.	2 1/2	4 1/2
Nominal embedment depth	h_{nom}	in.	2	4
Minimum effective embedment depth	h_{ef}	in.	1.32	3.02
Characteristic pullout strength, uncracked concrete over metal deck	$N_{p, deck, uncr}$	lbf	1,720	4,950
Characteristic pullout strength, cracked concrete over metal deck	$N_{p, deck, cr}$	lbf	975	2,805
Characteristic shear strength, concrete over metal deck	$V_{sa, deck}$	lbf	3,825	6,130
Characteristic shear strength - seismic, concrete over metal deck	$V_{sa, deck, eq}$	lbf	2,820	4,520
Reduction factor for pullout strength in tension, Condition B	ϕ	—	0.65	
Reduction factor for steel strength in shear, Condition B	ϕ	—	0.60	

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹Values for $N_{p,dec,uncr}$, $N_{p,dec,cr}$, $V_{sa,deck}$ and $V_{sa,deck,eq}$ apply to sand-lightweight concrete having a minimum concrete compressive strength, f'_c , of 3,000 psi.

²The characteristic pull-out strength for greater concrete compressive strengths shall be increased by multiplying the tabular value by $(f'_c/3,000 \text{ psi})^{0.5}$.

³All values of ϕ apply to the load combinations of IBC Section 1605.2, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4. For installations where reinforcement that complies with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, requirements for Condition A is present, the appropriate ϕ factor must be determined in accordance with ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable.

⁴The minimum anchor spacing along the flute must be the greater of $3h_{ef}$ or 1.5 times the flute width in accordance with Section 4.1.11 of this report.

⁵Installation must comply with Figure 6 of this report.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

EVALUATION SUBJECT:

TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors for use in cracked and uncracked concrete, described in ICC-ES evaluation report [ESR-3699](#), have also been evaluated for compliance with the codes noted below as adopted by Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2017 *City of Los Angeles Building Code* (LABC)
- 2017 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report [ESR-3699](#), comply with LABC Chapter 19, and LARC, and are subjected to the conditions of use described in this report.

3.0 CONDITIONS OF USE

The Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-3699](#).
- The design, installation, conditions of use and labeling of the anchors are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the evaluation report [ESR-3699](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The allowable and strength design values listed in the evaluation report and tables are for the connection of the anchors to the concrete. The connection between the anchors and the connected members shall be checked for capacity (which may govern).

This supplement expires concurrently with the evaluation report, reissued March 2020.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

EVALUATION SUBJECT:

TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tapcon+ Screw Anchors and SAMMYS Anchors for Threaded Rods for use in cracked and uncracked concrete, recognized in ICC-ES evaluation report ESR-3699, have also been evaluated for compliance with the codes noted below.

Compliance with the following codes:

- 2014 *Florida Building Code—Building*
- 2014 *Florida Building Code—Residential*

2.0 PURPOSE OF THIS SUPPLEMENT

The Tapcon+ Screw Anchors and SAMMYS Screw Anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report, ESR-3699, comply with the 2014 *Florida Building Code—Building* and 2014 *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2012 *International Building Code*® (IBC) provisions noted in the evaluation report, and under the following conditions:

- Design wind loads must be based on Section 1609 of the 2014 *Florida Building Code—Building* or Section 301.2.1.1 of the 2014 *Florida Building Code—Residential*, as applicable.
- Load combinations must be in accordance with Section 1605.2 or Section 1605.3 of the 2014 *Florida Building Code—Building*, as applicable.

Use of the Tapcon+ Screw Anchors and SAMMYS Screw Anchors for use in cracked and uncracked concrete, for compliance with the High-Velocity Hurricane Zone provisions of the 2014 *Florida Building Code—Building* and 2014 *Florida Building Code—Residential*, has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 9N-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued March 2020.

Large Diameter Tapcon (LDT) Self-threading



SPECIFIED FOR ANCHORAGE INTO CONCRETE

The LDT anchor is a high performance anchor that cuts its own threads into concrete.

Anchor bodies are made of hardened carbon steel and zinc plated.

Grade 5

The anchors shall have a finished hex washer head with anti-rotation serrations to prevent anchor back-out. The head of the anchor is stamped with a length identification code for easy inspection.

The anchor shall be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994.

LDT 3/8" and 1/2" are available with EnvireX coating

1,000 hours salt spray ASTM B117. Approved for use in ACQ and MCQ lumber*

*Excessive content of copper in the ACQ and MCQ lumber may affect the anchor finish.

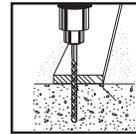
LENGTH INDICATION CODE*

CODE	LENGTH OF ANCHOR In. (mm)	
A	1-1/2 < 2	(38.1 < 50.8)
B	2 < 2-1/2	(50.8 < 63.5)
C	2-1/2 < 3	(63.5 < 76.2)
D	3 < 3-1/2	(76.2 < 88.9)
E	3-1/4 < 4	(88.9 < 101.6)
F	4 < 4-1/2	(101.6 < 114.3)
G	4-1/2 < 5	(114.3 < 127.0)
H	5 < 5-1/2	(127.0 < 139.7)

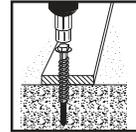
* Located on top of anchor for easy inspection.

INSTALLATION STEPS

Installation Steps for Concrete, Lightweight Concrete and Metal Deck

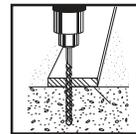


1. Using the proper size carbide bit (see chart) drill a pilot hole at least 1" deeper than anchor embedment.

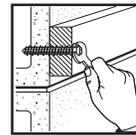


2. Using an **electric impact wrench**, or socket wrench (hand install) insert anchor into hole and tighten anchor until fully seated. (see chart for socket size) (do not over tighten).

Installation Steps for Hollow or Grout-Filled CMU (3/8" and 1/2" diameter)



1. Using a 5/16" (for 3/8" LDT) or 7/16" (for 1/2" LDT) carbide tipped bit, drill a pilot hole at least 1" deeper than anchor embedment.



2. Using a socket wrench insert anchor into hole and hand tighten (only) anchor until fully seated. (9/16" socket for 3/8" and 3/4" socket for 1/2") (do not over tighten).



LDT's can be installed by hand or with an impact wrench

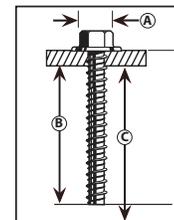
Installation by hand—is easy, simply using a socket wrench



Installation by impact wrench—is recommended for faster installations or for high volume projects. Installation with impact wrench—is **not** recommended for hollow block.

Selection Chart

LDT Size	ANSI Standard Drill Bit Diameter	Ⓐ Anchor Head (Socket Size) Diameter	Washer Diameter	Ⓑ Minimum Embedment	Ⓒ Hole Depth	USE IN		
						Concrete	CMU	
							Hollow	Grout-filled
LDT 3/8"	5/16"	9/16"	13/16"	1-1/2"	2-1/2"	YES	YES	YES
LDT 1/2"	7/16"	3/4"	1"	2-1/2"	3-1/2"	YES	NO	YES
LDT 5/8"	1/2"	13/16"	1-3/16"	2-3/4"	3-3/4"	YES	NO	YES
LDT 3/4"	5/8"	15/16"	1-5/16"	3-1/4"	4-1/4"	YES	NO	YES



Ⓒ See catalog for effective lengths and length indication code.

PERFORMANCE TABLES

LDT Anchors Ultimate Tension and Shear Values (Lbs/kN) in Concrete

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	f'c = 2000 PSI (13.8 MPa)		f'c = 3000 PSI (20.7 MPa)		f'c = 4000 PSI (27.6 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	1,336 (5.9)	2,108 (9.4)	1,652 (7.3)	2,764 (12.3)	1,968 (8.8)	3,416 (15.2)
	2 (50.8)	1,492 (6.6)	3,036 (13.5)	2,024 (9.0)	3,228 (14.4)	2,552 (11.4)	3,420 (15.2)
	2-1/2 (63.5)	3,732 (16.6)	3,312 (14.7)	3,748 (16.7)	3,364 (15.0)	3,760 (16.7)	3,424 (15.2)
	3-1/2 (88.9)	5,396 (24.0)	3,312 (14.7)	6,624 (29.5)	3,368 (15.0)	7,852 (34.9)	3,428 (15.2)
1/2 (12.7)	2 (50.8)	3,580 (15.9)	5,644 (25.1)	3,908 (17.4)	6,512 (29.0)	4,236 (18.8)	7,380 (32.8)
	3-1/2 (88.9)	7,252 (32.3)	6,436 (28.6)	8,044 (35.8)	7,288 (32.4)	8,836 (39.3)	8,140 (36.2)
	4-1/2 (114.3)	10,176 (45.3)	7,384 (32.8)	10,332 (46.0)	7,968 (35.4)	10,488 (46.7)	8,552 (38.0)
5/8 (15.9)	2-3/4 (69.9)	5,276 (23.5)	8,656 (38.5)	6,560 (29.2)	11,064 (49.2)	7,844 (34.8)	13,476 (59.9)
	3-1/2 (88.9)	7,972 (35.5)	10,224 (45.5)	9,848 (43.8)	12,144 (54.0)	11,724 (52.2)	14,060 (62.5)
	4-1/2 (114.3)	11,568 (51.5)	12,316 (54.8)	13,432 (59.8)	13,580 (60.4)	16,892 (75.1)	14,840 (66.0)
3/4 (19.1)	3-1/4 (82.6)	6,876 (30.6)	7,140 (31.8)	9,756 (43.4)	10,728 (47.7)	12,636 (56.2)	14,316 (63.6)
	4-1/2 (114.3)	10,304 (45.8)	13,120 (58.4)	14,424 (64.2)	16,868 (75.0)	18,540 (82.5)	20,612 (91.7)
	5-1/2 (139.7)	13,048 (58.0)	17,908 (79.7)	18,156 (80.8)	21,718 (96.9)	23,268 (130.5)	25,652 (114.1)

LDT Anchors Allowable Tension and Shear Values* (Lbs/kN) in Concrete Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	f'c = 2000 PSI (13.8 MPa)		f'c = 3000 PSI (20.7 MPa)		f'c = 4000 PSI (27.6 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	334 (1.5)	527 (2.3)	413 (1.8)	691 (3.1)	492 (2.1)	854 (3.8)
	2 (50.8)	373 (1.7)	759 (3.4)	506 (2.2)	807 (3.6)	638 (2.8)	855 (3.8)
	2-1/2 (63.5)	933 (4.2)	828 (3.7)	937 (4.2)	841 (3.7)	940 (4.2)	856 (3.8)
	3-1/2 (88.9)	1,349 (6.0)	828 (3.7)	1,656 (7.4)	842 (3.7)	1,963 (8.7)	857 (3.8)
1/2 (12.7)	2 (50.8)	895 (4.0)	1,411 (6.3)	977 (4.3)	1,628 (7.2)	1,059 (4.7)	1,845 (8.2)
	3-1/2 (88.9)	1,813 (8.0)	1,609 (7.2)	2,011 (8.9)	1,822 (8.1)	2,209 (9.8)	2,035 (9.0)
	4-1/2 (114.3)	2,544 (11.3)	1,846 (8.2)	2,583 (11.5)	1,992 (8.9)	2,622 (11.7)	2,138 (9.5)
5/8 (15.9)	2-3/4 (69.9)	1,319 (5.9)	2,164 (9.7)	1,640 (7.3)	2,766 (12.3)	1,961 (8.7)	3,369 (15.0)
	3-1/2 (88.9)	1,993 (8.9)	2,556 (11.4)	2,462 (10.9)	3,036 (13.5)	2,931 (13.0)	3,515 (15.6)
	4-1/2 (114.3)	2,892 (12.9)	3,079 (13.7)	3,358 (14.9)	3,395 (15.1)	4,223 (18.8)	3,710 (16.5)
3/4 (19.1)	3-1/4 (82.6)	1,719 (7.6)	1,785 (7.9)	2,439 (10.8)	2,682 (11.9)	3,159 (14.0)	3,579 (15.9)
	4-1/2 (114.3)	2,576 (11.5)	3,280 (14.6)	3,606 (16.0)	4,217 (18.7)	4,635 (20.6)	5,153 (22.9)
	5-1/2 (139.7)	3,262 (14.5)	4,477 (19.9)	4,539 (20.2)	5,445 (24.2)	5,817 (25.9)	6,413 (28.5)

* Allowable values are based upon a 4 to 1 safety factor. (Ultimate/4)

LDT Anchors Recommended Edge & Spacing Requirements for Tension Loads* Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. EDGE DISTANCE 1-3/4 Inches (44mm)	SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3 Inches (76mm)
3/8 (9.5)	1-1/2 (38.1)	2 (50.8)	70%	6 (152.4)	44%
	2 (50.8)	2 (50.8)	70%	6 (152.4)	44%
	2-1/2 (63.5)	3 (76.2)	70%	6 (152.4)	44%
	3-1/2 (88.9)	4 (101.6)	70%	6 (152.4)	44%
1/2 (12.7)	2 (50.8)	2-1/4 (57.2)	65%	8 (203.2)	27%
	3-1/2 (88.9)	3 (76.2)	65%	8 (203.2)	27%
	4-1/2 (114.3)	4 (101.6)	65%	8 (203.2)	27%

* Edge and spacing distance shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

For 5/8" and 3/4" LDT Anchors, the critical edge distance for these anchors is 10 times the anchor diameter. The edge distance of these anchors may be reduced to 1-3/4" provided a 0.65 load factor is used for tension loads, a 0.15 load factor is used for shear loads applied perpendicular to the edge, or a 0.60 load factor is used for shear loads applied parallel to the edge. Linear interpolation may be used for intermediate edge distances.

PERFORMANCE TABLES

LDT Anchors

Recommended Edge & Spacing Requirements for Shear Loads* Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. EDGE DISTANCE 1-3/4 Inches (44mm)	SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3 Inches (76mm)
3/8 (9.5)	1-1/2 (38.1)	3 (76.2)	25%	6 (152.4)	57%
	2 (50.8)	4 (101.6)	25%	6 (152.4)	57%
	2-1/2 (63.5)	5 (127.0)	25%	6 (152.4)	57%
	3-1/2 (88.9)	5 (127.0)	25%	6 (152.4)	57%
1/2 (12.7)	2 (50.8)	5 (127.0)	25%	8 (203.2)	60%
	3-1/2 (88.9)	5 (127.0)	25%	8 (203.2)	60%
	4-1/2 (114.3)	5-1/2 (139.7)	25%	8 (203.2)	60%

* Edge and spacing distances shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

LDT Anchors

Ultimate Tension Load (Lbs/kN) in Concrete Block (anchors should be installed by hand in hollow block)

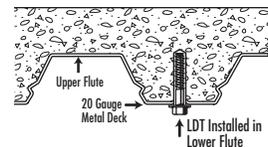
ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	HOLLOW CONCRETE BLOCK		GROUT FILLED CONCRETE BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	916 (4.1)	3,176 (14.1)	1,592 (7.1)	3,900 (17.3)
1/2 (12.7)	2-1/2 (63.5)	N/A	N/A	5,924 (26.4)	6,680 (29.7)

LDT Anchors

Allowable Tension and Shear* (Lbs/kN) in Concrete Block (anchors should be installed by hand in hollow block)

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	HOLLOW CONCRETE BLOCK		GROUT FILLED CONCRETE BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	229 (1.0)	794 (3.5)	398 (1.8)	975 (4.3)
1/2 (12.7)	2-1/2 (63.5)	N/A	N/A	1,481 (6.6)	1,670 (7.4)

*Allowable values are based upon a 4 to 1 safety factor. (Ultimate/4)



LDT Anchors

Anchoring Overhead in 3000 PSI Lightweight Concrete On Metal Deck

ANCHOR In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT In. (mm) Lbs. (kN)	3000PSI (20.7 MPa) CONCRETE			
				ULTIMATE TENSION LOAD Lbs. (kN)		ALLOWABLE WORKING LOAD
3/8" LDT	5/16 (7.9)	1-1/2 (38.1)	Upper Flute	2,889 (12.9)	722 (3.2)	
			Lower Flute	1,862 (8.3)	465 (2.1)	

PRODUCT DATA SHEET

SikaGrout®-428 FS

High performance, fast setting, non-shrink, cement grout

PRODUCT DESCRIPTION

SikaGrout®-428 FS is a non-shrink, non-metallic, cementitious precision grout powered by ViscoCrete technology. SikaGrout®-428 FS is designed to achieve high early strength and exceptional ultimate strengths at a fluid consistency. A structural, precision grout, SikaGrout®-428 FS can be placed from plastic to fluid over a temperature range.

USES

- For quick turnaround applications, when rate of strength gain is a significant consideration.
- Grouting of railing posts, foundations, windmills, compressors, etc.
- Non-shrink grouting of machinery and equipment, base plates, sole plates, precast panels, beams, columns and curtain walls.

PRODUCT INFORMATION

Packaging	65 lb (29.5 kg) bag
Appearance / Color	Gray powder
Shelf Life	12 months from date of production if stored properly in original, unopened and undamaged sealed packaging
Storage Conditions	Store dry at 40–95 °F (4–35 °C) Protect from moisture. If damp, discard material

- Applications where a non-shrink grout is needed for maximum effective bearing area.
- To transfer optimum load.
- For grouting rebar, bolts, dowels and pins, etc.

CHARACTERISTICS / ADVANTAGES

- Quick rate of strength gain
- Multiple fluidity with one material
- Outstanding performance in fluid state
- Excellent fluidity, sufficient time for placement
- Non-metallic, will not stain or rust

APPROVALS / STANDARDS

- Meet ASTM C-1107 (Grade C)
- Shows positive expansion as per ASTM C-827

TECHNICAL INFORMATION

Compressive Strength

<u>Plastic</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>	(ASTM C-109) 50 % R.H
5 hours	750 psi (5.2 MPa)	2,500 psi (17.2 MPa)	6,000 psi (41.4 MPa)	
6 hours	1,000 psi (6.9 MPa)	3,500 psi (24.1 MPa)	7,000 psi (48.3 MPa)	
1 day	4,000 psi (27.6 MPa)	7,000 psi (48.3 MPa)	9,000 psi (62.1 MPa)	
3 days	5,500 psi (37.9 MPa)	9,500 psi (65.5 MPa)	11,000 psi (75.8 MPa)	
7 days	7,500 psi (51.7 MPa)	12,000 psi (82.7 MPa)	12,000 psi (82.7 MPa)	
28 days	11,000 psi (75.8 MPa)	13,000 psi (89.6 MPa)	13,000 psi (89.6 MPa)	

<u>Flowable</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>
5 hours	500 psi (3.4 MPa)	2,000 psi (13.8 MPa)	5,000 psi (34.5 MPa)
6 hours	750 psi (5.2 MPa)	3,000 psi (20.7 MPa)	5,500 psi (37.9 MPa)
1 day	3,500 psi (24.1 MPa)	7,000 psi (48.3 MPa)	7,000 psi (48.3 MPa)
3 days	5,000 psi (34.5 MPa)	9,000 psi (62.1 MPa)	9,500 psi (65.5 MPa)
7 days	7,000 psi (48.3 MPa)	11,000 psi (75.8 MPa)	11,000 psi (75.8 MPa)
28 days	10,500 psi (72.4 MPa)	12,500 psi (86.2 MPa)	12,500 psi (86.2 MPa)

<u>Fluid</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>
5 hours	< 200 psi (1.4 MPa)	1,000 psi (6.9 MPa)	4,000 psi (27.6 MPa)
6 hours	< 500 psi (3.4 MPa)	3,000 psi (20.7 MPa)	6,000 psi (41.4 MPa)
1 day	3,250 psi (22.4 MPa)	7,500 psi (51.7 MPa)	8,000 psi (55.2 MPa)
3 days	6,000 psi (41.4 MPa)	8,500 psi (58.6 MPa)	8,500 psi (58.6 MPa)
7 days	7,500 psi (51.7 MPa)	10,000 psi (69 MPa)	10,000 psi (69 MPa)
28 days	10,000 psi (69 MPa)	12,000 psi (82.7 MPa)	12,000 psi (82.7 MPa)

Effective Bearing Area > 95 % (ASTM C-1339)

Splitting tensile strength 28 days > 1,000 psi (6.9 MPa) (ASTM C-496)
73 °F (23 °C)
50 % R.H

Pull-Out Resistance	40 °F	73 °F	90 °F	(ASTM C-1583) 50 % R.H
	1 day	200 psi (1.4 MPa)	> 400 psi (2.8 MPa)	
7 days	400 psi (2.8 MPa)	> 500 psi (3.4 MPa)	> 500 psi (3.4 MPa)	
28 days	450 psi (3.1 MPa)	> 550 psi (3.8 MPa)	> 550 psi (3.8 MPa)	

Tensile Adhesion Strength	1 day	7 days	28 days	(ASTM C-882 modified)*
	1,800 psi (12.4 MPa)	2,200 psi (15.2 MPa)	2,500 psi (17.2 MPa)	

* Mortar scrubbed into substrate at 73 °F (23 °C) and 50 % R.H.

Expansion	40 °F	73 °F	90 °F	(ASTM C-827)
	1 day	Positive	Positive	
7 days	Positive	Positive	Positive	
28 days	Positive	Positive	Positive	

Rapid Chloride Permeability	28 days (60 Volts)	< 1,000 C	(ASTM C-1202 AASHTO T-277)

APPLICATION INFORMATION

Mixing Ratio	Plastic	Flowable	Fluid
	6.5 pts (3.1 L)	7.0 pts (3.3 L)	8 pts (3.8 L)

Coverage	0.50 ft ³ (0.02 m ³) per bag (Coverage figures do not include allowance for surface profile and porosity or material waste)

Layer Thickness	Min.	Max.
	Neat	1/4" (6.4 mm)
Extended	1" (25.4 mm)	6" (152.4 mm)

Flowability	40 °F	73 °F	90 °F	(ASTM C-939 Modified - 3/4" nozzle)
	< 45 sec	> 30 sec	> 30 sec	

Product Temperature	65–75 °F (18–24 °C)

Ambient Air Temperature	> 40 °F (4 °C)

Substrate Temperature	> 40 °F (4 °C)

Pot Life	~ 10 minutes
	As the temperature will affect the pot life, application temperature: <ul style="list-style-type: none"> ▪ Above 73 °F (23 °C) will reduce the fluidity ▪ Below 73 °F (23 °C) will extend the fluidity

Set Time	initial Set	>30 minutes	(ASTM-266) 73 °F (23 °C) 50 % R.H.
	Final Set	>45–60 minutes	



BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

0 g/l

(EPA method 24)

LIMITATIONS

- Do not use as a patching or overlay mortar or in unconfined areas.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur® 32 Hi-Mod.

APPLICATION INSTRUCTIONS

SURFACE PREPARATION

- Surface must be clean and sound. Remove all deteriorated concrete, dirt, oil, grease, and other bond-inhibiting materials from the area to be repaired.
- Anchor bolts to be grouted must be de-greased with suitable solvent.
- Preparation work should be done by high pressure water blast, scabber or other appropriate mechanical means to promote mechanical adhesion.
- To ensure optimum repair results, the effectiveness of decontamination and preparation should be assessed by a pull-off test.
- Substrate should be Saturated Surface Dry (SSD) with clean water prior to application. No standing water should remain during application.

FORMING

- For pourable grout, construct forms to retain grout without leakage.
- Forms should be lined or coated with bond-breaker for easy removal.
- Forms should be sufficiently high to accommodate head of grout.
- Where grout-tight form is difficult to achieve, use SikaGrout®-428 FS in dry pack consistency.

MIXING

- Make sure all forming, mixing, placing, and clean-up materials are on hand.
- Add the appropriate amount of water (depend on the desired flow) of clean potable water (approx 70 °F) into a suitably sized and clean mixing container, using a calibrated measuring jug, or similar, to ensure strict control of the water content (do not over-water).
- Add 1 bag while continuing to mix with a low-speed drill (400-600 rpm) and Sika mixing paddle or a jiffy paddle or in an appropriate mortar mixer.
- Once all the powder has been added, mix for approximately 3 minutes, until a lump-free and uniform consistency is achieved.
- Do not over mix.
- For warmer temperatures use cold water and for colder temperatures use warm water.
- For cold temperature start with 7/8 of a gallon and add remaining 1/8, only if needed for fluid consistency.
- Refer to ACI 306 Guidelines when there is a need to place this grout in cold & hot temperatures.

EXTENSION WITH AGGREGATES

- For deeper applications, SikaGrout®-428 FS may be extended with 3/8" (9.5 mm) pea gravel (plastic and flowable consistencies only).
- The aggregate must be non-reactive (reference ASTM C-1260, C-227 and C-289), clean, well graded, Saturated Surface Dry (SSD), have low absorption and high density, and comply with ASTM C-33 size number 8 per Table 2.
- Variances in aggregate may result in different strengths.
- The addition rate is 30 lb (13.7 kg) of aggregate per bag. It is approximately 2.4 gal (9.1 L) by loose volume of aggregate.

APPLICATION

- Within no more than 10 minutes after mixing, place grout into forms in normal manner to avoid air entrapment.
- Mixed grout in mass will result in faster than expected setting times.
- Plan jobs accordingly so that the grout can be placed right after mixing.
- Vibrate, ram grout as necessary to achieve flow or compaction.
- SikaGrout®-428 FS must be confined leaving minimum exposed surface.
- After grout has achieved final set, remove forms, trim or shape exposed grout shoulders to designed profile.
- Wet cure for a minimum of 3 days or apply a water based curing compound which complies with ASTM C-309 on exposed surfaces.

OTHER RESTRICTIONS

See Legal Disclaimer.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the

Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: +1-800-933-7452
Fax: +1-201-933-6225
usa.sika.com

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



Product Data Sheet
SikaGrout®-428 FS
November 2020, Version 01.02
020201010010000107

product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs.

NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Sale of SIKA products are subject to the Terms and Conditions of Sale which are available at <https://usa.sika.com/en/group/SikaCorp/termsandconditions.html> or by calling 1-800-933-7452.

SikaGrout-428FS-en-US-(11-2020)-1-2.pdf



PROPOSER NAME: _____

Base Pricing

ITEM	VALUE
Bonds	\$ -
Temporary construction items	\$ -
CMU repairs	\$ -
Preparations & repainting	\$ -
Burn room liner	\$ -
Total	\$ -

Alternate Pricing (includes any additional costs for bonds, temporary const. items, etc.)

ITEM	VALUE
Clean and regrout all other exterior CMU	\$ -
Clean & repaint all other exposed exterior steel	\$ -

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EXHIBIT "F"
SCHEDULE
Page 1 of 1

Building tenants have agreed to suspend operations at the training tower for a period of two (2) consecutive weeks between June 6, 2022 and August 12, 2022. Contractor shall request two (2) week renovation period through Owner and schedule project to fit within these requirements, including submittals, materials lead times, mobilizations, installations, demobilizations, cleanup, punch list completion, etc.

Contractor to provide schedules as described in Exhibit "A" and above. Contractor shall complete Work as indicated on furnished schedules after which date liquidated damages shall apply. In any case, Final Completion of all Work shall be no later than August 12, 2022 after which date liquidated damages shall apply.

Work shall be performed only during construction hours approved by the City of San Marcos (i.e., between 7:00am & 4:00pm, Monday through Friday and between 8:00am & 3:00pm Saturdays). Work is not allowed on Sundays or city holidays without prior written approval of City Engineer.

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EXHIBIT "G"
SCHEDULE OF VALUES
Page 1 of 1

Per proposal form furnished with proposal – reference Sample Contract Exhibit "E".

**WO-XX-TBD
EXHIBIT "H"
PREVAILING WAGE REQUIREMENTS
Page 1 of 4**

The terms and definitions included in the City's contract documents are hereby incorporated by reference.

The following requirements apply to all public works projects awarded by the City of San Marcos that are subject to the payment of prevailing wages, without regard to the funding source. The requirements listed below comprise a summary of the prevailing wage obligations applicable to the Contractor and subcontractors performing work on a prevailing wage project, and are not a comprehensive list of the obligations required under State and/or Federal law. The Contractor and any subcontractors performing work under the Contractor should consult the Labor Code, the California Department of Industrial Relations ("DIR") and/or the U.S. Department of Labor for the latest prevailing wage rates and requirements and to determine compliance with all applicable prevailing wage laws.

PAYMENT OF PREVAILING WAGE RATES

1. STATE PROJECTS

Pursuant to Labor Code Section 1770 et seq., the Contractor and each subcontractor performing work under the Contractor for the Project shall pay not less than the prevailing rate of per diem wages as determined by the Director of the DIR. Copies of the prevailing rate of per diem wages for each craft, classification, or type of worker needed to execute this Agreement are available at the City Clerk's Office and at <http://www.dir.ca.gov/OPRL/PWD/index.htm>.

In accordance with Labor Code Section 1775, the Contractor and any subcontractor performing work under the Contractor for the Project shall forfeit to the DIR not more than Two Hundred Dollars and No/100 (\$200.00) per calendar day or any portion thereof, for each worker that is paid less than the prevailing wage rates by the Contractor or any subcontractor performing work under the Contractor for the Project.

2. FEDERAL PROJECTS (if applicable)

Pursuant to the Federal Davis-Bacon Act, the payment of prevailing wages is required on all federally-funded or federally-assisted projects in excess of \$2,000.00 for construction, alteration or repair of public buildings or public works. The Federal wage rate is determined by the U.S. Department of Labor, and Wage Determinations (WD) can be found online at the following website: <https://www.wdol.gov/>. The Contractor should check the WDOL.gov website prior to bid opening for any updates to the WD since the WD published 10 or more days prior to bid opening shall be effective. The WD in effect at bid opening will be attached to the contract as the applicable Federal prevailing wage rates.

Unless the Project is under the complete control of the Federal government, the higher of the Federal prevailing wage rate or the State prevailing wage rate shall be paid.

The Contractor shall comply with the provisions of 29 CFR Section 5.5, which are included as Attachment 1 to this Exhibit, if applicable. City shall report all suspected or reported violations to the Federal awarding agency.

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EXHIBIT "H"
PREVAILING WAGE REQUIREMENTS
Page 2 of 4**

CERTIFIED PAYROLL RECORDS

Pursuant to Labor Code Section 1776, the Contractor and each subcontractor performing work under the Contractor for the Project shall keep and submit accurate certified payroll records to the City and electronically to the Labor Commissioner via the Department of Industrial Relation's electronic certified payroll reporting system. Payroll records shall include the name, address, social security number, work classification, straight time and overtime hours worked each day and week, the actual per diem wages paid to the employee, and shall be signed under penalty of perjury by the Contractor or the subcontractor submitting the certified payroll records declaring that the information contained in the payroll record is true and correct and the employer has complied with the Labor Code requirements for any work performed under the Project. Such certified payroll records shall be made available at all reasonable hours at the principal office of the Contractor for inspection and/or copying purposes by the employee or his authorized representative, the City, or the DIR, and shall be furnished to the employee or his authorized representative, the City, or the DIR within 10 days after receipt of a written notice requesting the records. If the Contractor or any subcontractor fails to comply with the 10-day period to furnish certified payroll records to the City or the DIR, it shall forfeit One Hundred Dollars and No/100 (\$100.00) per calendar day or any portion thereof, for each worker in non-compliance, until compliance is effectuated.

In addition to the State certified payroll record requirements under Labor Code Section 1776, the Contractor and each subcontractor performing work under the Contractor for the Project shall also comply with the Federal payroll requirements under 29 CFR Section 5.5 (Attachment 1) if the Project is funded with federal dollars.

LIST OF SUBCONTRACTORS

Contractor shall comply with the Subletting and Subcontracting Fair Practices Act, California Public Contract Code Section 4100 et seq. ("Subcontracting Act"), including listing in the Bid and Contract Documents the name, address, DIR registration number and telephone number of the place of business, and the California contractor license number of each subcontractor who will perform work, provide labor, or render service to the Contractor on or about the construction of the work for this Project, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to the Bid and Contract Documents, in an amount in excess of one-half ($\frac{1}{2}$) of one percent (1%) of the Contractor's total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half ($\frac{1}{2}$) of one percent (1%) of the Contractor's total bid or ten thousand dollars (\$10,000), whichever is greater. City will not enter into any contract without proof that designated subcontractors are properly registered with the DIR, licensed and in good standing with the California Contractors State License Board pursuant to Public Contract Code Section 4104.

DIR REGISTRATION

Contractor, and each subcontractor who will perform work, provide labor, or render service to the Contractor on or about the construction of the work for this Project, must be annually registered with the DIR public works contractor registration program and must meet the minimum program

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EXHIBIT "H"
PREVAILING WAGE REQUIREMENTS
Page 3 of 4**

qualifications necessary to be eligible to work on public works projects. No Contractor or subcontractor may be awarded or perform work on a contract for public work unless registered with the DIR. City will not enter into any contract without proof of the Contractor and any designated subcontractor's current registration to perform public work under Labor Code Section 1725.5.

Effective to public work contracts awarded on or after July 1, 2016, entities that haul or deliver ready-mixed concrete to carry out public works projects are considered subcontractors under Labor Code section 1722.1 and must register with the DIR as specified in Labor Code section 1725.5. For additional information, view the DIR Concrete Delivery Legislation Fact Sheet available at https://www.dir.ca.gov/ConcreteDeliveryPrevailingWage/AB_219_Fact_Sheet.html.

APPRENTICES

Pursuant to Labor Code Section 1777.5, prior to commencing any work under this Contract, the Contractor and each subcontractor performing work under the Contractor for the Project shall submit contract award information to all applicable apprenticeship programs that can supply apprentices to the site of the public work. Information provided to apprenticeship programs shall include, but not be limited to, an estimate of journeyman hours to be performed under the Contract, the number of apprentices proposed to be employed, and the approximate dates the apprentices would be employed. Apprentices shall be employed in at least the minimum ratio required under the Labor Code of one hour of apprentice work for every five hours of journeyman work. Every apprentice employed on the Project shall be paid the prevailing rate of per diem wages for apprentices in the trade to which the apprentice is registered.

Pursuant to Labor Code Section 1777.5, the Contractor and each subcontractor performing work under the Contractor for the Project who employs journeymen or apprentices in any apprenticeable craft or trade shall contribute to the California Apprenticeship Council the same amount that the Director of the DIR determines is the prevailing amount of apprenticeship training contributions in the area of the Project site. Training fund contributions must be paid for every hour worked by every journeyman and apprentice working in an apprenticeable craft. Training fund contribution rates for journeymen and apprentices can be found at <https://www.dir.ca.gov/oprl/DPreWageDetermination.htm>. The Contractor may take as a credit for payments to the California Apprenticeship Council any amounts paid by the Contractor to an approved apprenticeship program that can supply apprentices to the Project site.

If the Contractor or any subcontractor fails to solicit apprenticeship programs, it shall forfeit One Hundred Dollars and No/100 (\$100.00) for each full calendar day of noncompliance.

JOB SITE NOTICES

The Contractor shall post the following notices on each job site for the Project:

This public works project is subject to monitoring and investigative activities by the Compliance Monitoring Unit (CMU) of the Division of Labor Standards Enforcement (DLSE), Department of Industrial Relations (DIR), State of California. This Notice is

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EXHIBIT "H"
PREVAILING WAGE REQUIREMENTS
Page 4 of 4**

intended to provide information to all workers employed in the execution of the contract for public work and to all contractors, subcontractors performing work under the contractor for the project, and other persons having access to the job site to enable the CMU to ensure compliance with and enforcement of prevailing wage laws on public works projects.

The prevailing wage laws require that all workers be paid at least the minimum hourly wage as determined by the Director of the DIR for the specific classification (or type of work) performed by workers on the project. These rates are listed on a separate job site posting of minimum prevailing rates required to be maintained by the public entity which awarded the public works contract. Complaints concerning nonpayment of the required minimum wage rates to workers on this project may be filed with the CMU at any office of the DLSE.

Local DLSE Office Telephone Number: (619) 220-5451_____

Complaints should be filed in writing immediately upon discovery of any violations of the prevailing wage laws due to the short period of time following the completion of the project that the CMU may take legal action against those responsible.

Complaints should contain details about the violations alleged (for example, wrong rate paid, not all hours paid, overtime rate not paid for hours worked in excess of 8 per day or 40 per week, etc.) as well as the name of the employer, the public entity which awarded the public works contract, and the location and name of the project.

For general information concerning the prevailing wage laws and how to file a complaint concerning any violation of these prevailing wage laws, you may contact any DLSE office. Complaint forms are also available on the DIR website www.dir.ca.gov/dlse/PublicWorks.html.

DIR ENFORCEMENT

This Project is subject to compliance monitoring and enforcement by the DIR.

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EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 1 of 18**

A. Instructions to complete Proposal Forms

Proposal Forms must be submitted on the forms provided. Proposals submitted in any other form will be considered non-responsive and shall be rejected. Proposals shall include the information requested and blank spaces on the appropriate proposal forms must be properly filled in, and the content thereof must not be changed. Additions or changes shall not be made to the items mentioned therein. All requested information provided shall be typewritten or printed legibly in spaces provided.

The Proposal Forms must be signed with the name and title of the person duly authorized to bind the legal entity of the Proposer. Upon request by the City, the Proposer shall provide evidence that the individuals signing the document are authorized to bind the legal entity of the Proposer.

Authorized Signatures

- Sole Proprietorship: If the Proposer is a sole proprietorship, either a Fictitious Business Name Statement or a City of San Marcos business license is sufficient to establish the authority of an individual to bind the sole proprietorship.
- Corporation: If the Proposer is a corporation, proof of authorization shall be established (pursuant to Corporation Code Section 313) if one of the corporate officers listed in column A below and one of the corporate officers listed in column B below both sign the documents.

A		B
Chairman of Board		Secretary
OR		OR
President		Assistant Secretary
OR	AND	OR
Vice President		Chief Financial Officer
		OR
		Assistant Treasurer

For any other combination of signatures of corporate officers, a copy of the Board minutes, resolution, or articles of incorporation may be submitted to establish that the individuals have the authority to bind the corporation.

- Partnership: If the Proposer is a partnership, a Certificate of Partnership (State form LP-1 for Limited Partnerships), or a copy of the partnership agreement is sufficient to establish the authority of a single general partner to bind the partnership.
- Multiple Entities: If the individual or individuals signing the documents are signing on behalf of an entity other than the Proposer, and that other entity is authorized to bind the legal entity of the Proposer, then documentation must be submitted which establishes that the individuals have the authority to bind the other entity, and that the other entity has the authority to bind the legal entity of the Proposer.

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EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 2 of 18**

B. Proposal Forms

- 1 PROPOSAL FORM FOUND IN EXHIBIT "E" OF SAMPLE AGREEMENT**
- 2 BIDDER'S LIST OF SUBCONTRACTORS (DBE AND NON-DBE)**

Complete the following.

In order to comply with the Subletting and Subcontracting Fair Practices Act as set forth in Public Contract Code Section 4100 et seq. ("Subcontracting Act"), the Bidder is required to submit information regarding subcontractors under the Bid Documents. With respect to and incident to the above entitled Project, the undersigned Bidder states that the following is/are the name(s), locations of the place(s) of business, California contractor license number, public works contractor registration number issued pursuant to Section 1725.5 of the Labor Code, dollar amount and portion of work to be performed by each subcontractor who will perform work or labor or render service to the Project or a subcontractor licensed by the State who, under subcontract to the Bidder, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the Contract Documents, and is performing work or labor or rendering service in an amount in excess of one-half (1/2) of one percent (1%) of the bidders total bid or ten thousand dollars (\$10,000), whichever is greater. Bidder further states that all listed subcontractors have been made aware of the Contract requirements relating to nondiscrimination and insurance.

If the Bidder fails to specify a subcontractor or if the Bidder specifies more than one subcontractor for the same portion of the work in excess of one-half (1/2) of one percent (1%) of the Bidder's total bid or ten thousand dollars (\$10,000), whichever is greater, the Bidder agrees that it is fully qualified to perform that portion itself, and that the Bidder shall perform that portion itself.

The Bidder shall list only one subcontractor for each portion of the Work as identified in the Bid Schedule. Partial submittal or failure to include all required information regarding subcontractors may preclude the full analysis and review of the Bid and may be cause to disqualify the Bid as non-responsive. However, an inadvertent error in listing the California contractor license number or public works contractor registration number shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the corrected license number is submitted to the Agency by the Bidder within 24 hours' after the bid opening and provided the correct license number corresponds to the submitted name and location for that subcontractor.

The Bidder shall be subject to the penalties set forth in the Subcontracting Act if the Bidder lists in his bid another contractor who will in turn sublet portions constituting the majority of work covered by the prime contract.

If, after award of Contract, the successful bidder ("Contractor") subcontracts, except as provided in the Subcontracting Act, the Contractor shall be subject to the penalties set forth in the Subcontracting Act. If the Contractor violates any provisions of the Subcontracting Act or the Contract, the Agency may either cancel this Contract or assess a penalty to the Contractor in accordance with the terms of the Subcontracting Act.

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EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 3 of 18**

BIDDER'S LIST OF SUBCONTRACTORS (DBE AND NON-DBE)

Complete this form for all subcontractors who will perform work amounting to more than one half of one percent (0.5%) of the Total Bid or \$10,000 (whichever is greater).

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information may be used by Agency to track each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid or \$10,000 (whichever is greater). Photocopy this form for additional firms.

Subcontractor Name and Location	Description of Portion of Work	Total Subcontract Amount	Contractor License Number
			DIR Number
<i>Name</i>			
<i>Address</i>			
<i>City State ZIP</i>			
<i>Name</i>			
<i>Address</i>			
<i>City State ZIP</i>			
<i>Name</i>			
<i>Address</i>			
<i>City State ZIP</i>			
<i>Name</i>			
<i>Address</i>			
<i>City State ZIP</i>			

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EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 4 of 18**

3 NONCOLLUSION AFFIDAVIT/DECLARATION

(Title 23 United States Code Section 112 and Public Contract Code Section 7106)

To the City of San Marcos

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], __ [state].

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 5 of 18**

4 DISCLOSURE AND CERTIFICATION REGARDING CONFLICT OF INTEREST

The Bidder hereby acknowledges that it has read the Conflict of Interest Requirements included in the Bid Documents and has, to the best of its knowledge and belief:

(Choose One)

- Determined that there are no relevant facts or circumstances which could give rise to conflicts of interest. (Bidder may provide an explanation or any supporting documentation).
- Determined that one or more conflicts of interest exists. (Bidder must provide a detailed description of the conflict and a proposed plan for avoiding, neutralizing or mitigating the negative effects of the conflict).

Bidder agrees to:

- 1) implement and maintain an internal compliance program to ensure compliance with contract requirements and to monitor potential conflicts of interest; and
- 2) disclose conflicts of interest to the Agency during the duration of the contract, if awarded a contract; and
- 3) include this Disclosure in all contracts with Subcontractors and payees receiving more than ten thousand dollars (\$10,000) in funds in connection with the work of Agency.

By signing below, the Bidder certifies that the information contained in this form is accurate to the best of its knowledge, and that the Bidder agrees to comply with the requirements herein. The Bidder has a continuing obligation to the Agency to disclose conflicts of interest to the Agency during the solicitation phase or, if awarded a contract, throughout the duration of the contract.

Legal Name of Bidder :	
Name of Person Authorized to Sign :	
Title:	
Signature:	
Date:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 6 of 18**

5 IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Section 2200 *et seq.*)

As required by California Public Contract Code section 2204, the Contractor certifies under penalty of perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code sections 2200, *et seq.*) is true and correct:

- The Contractor is not:
 - (i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203; or
 - (ii) a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.
- The Contractor has been exempted from the requirements of the Iran Contracting Act of 2010 after a public finding with respect to the contract in question that, absent the exemption, the City of San Marcos will be unable to obtain the goods and/or services to be provided pursuant to the Contract.
- The amount of the Contract payable to the Contractor for the Project does not exceed \$1,000,000.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am authorized to sign this Certification for the Contractor.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

Note: In accordance with Public Contract Code section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of \$250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years. The City of San Marcos also reserves remedies available to it with respect to any such false certification.

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 7 of 18**

6 HAZARDOUS MATERIAL CERTIFICATION

Contractor shall notify the Agency and post proper warning signs if any materials or substances are used that are affected by the Proposition 65 Regulations. Contractor shall provide the Agency a copy of the Material Safety Data Sheet (MSDS) for all materials listed on the Federal/OSHA Director's List of Hazardous Materials. Contractor will be responsible for the safe storage, use and application of the product(s) as well as your firm having in place a written hazard communication program and injury and illness prevention program.

The Bidder certifies that it will comply with all applicable local, state, and federal laws and regulations regarding the transportation, storage, use, and application of hazardous and/or contaminated materials.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 8 of 18**

7 DEBARMENT AND SUSPENSION CERTIFICATION

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 9 of 18**

8 EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The Contractor/Bidder _____ hereby certifies that he/she

has has not
(MUST CHECK ONE)

participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, 11246, or 11375 and that, where required, he/she has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Notes: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

The language of this certification shall be included for all subawards (including subcontracts, etc.) at all tiers.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 10 of 18**

9 PUBLIC CONTRACT CODE STATEMENTS

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder

has has not

(MUST CHECK ONE)

been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 11 of 18**

10 PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes No

If the answer is yes, explain the circumstances in the following space.

Legal Name of Bidder :	
Name of Person Authorized to Sign:	
Title:	
Signature:	
Date:	

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
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11 PROPOSERS QUESTIONNAIRE

1. CONTRACTOR'S REGISTRATION

Proposer certifies, under penalty of perjury, that Proposer is currently registered with the California Department of Industrial Relations public works contractor registration program in compliance with Labor Code Section 1725.5. Proposer further certifies that Proposer is in compliance with the minimum contractor registration program qualifications necessary under Labor Code Section 1725.5(a) to be eligible to work on public works projects in the City of San Marcos.

Proposer's DIR Registration No. _____

2. CONTRACTOR'S LICENSE

Proposer certifies, under penalty of perjury, that the following information is true and correct. Any proposal not containing a State Contractor's License Number that is active and currently in good standing with the California Contractors State License Board, and of the Classification specified by the Agency in Instructions to Proposers, and Expiration Date or a proposal containing information which is subsequently proven false, shall be considered non-responsive and shall be rejected by the Agency.

Proposer's Legal Name _____

State Contractor License No. and Class _____

Original Date License No. Issued _____

License No. Expiration Date _____

3. OTHER PRINCIPALS WITH PROPOSER

The following are the names, titles, addresses, and phone numbers of all individuals, firm members, partners, joint ventures, and/or corporate officers having a principal interest in this proposal.

All current and prior DBA's, aliases, and/or fictitious business names for any principal having an interest in this proposal are as follows:

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
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PROPOSERS QUESTIONNAIRE CONTINUED

4. BANKRUPTCY JUDGMENTS AND FINANCIAL CONDITION

If requested by Agency, the Proposer shall furnish (within 10 working days of the request) a notarized financial statement, further references, and other information sufficiently comprehensive to permit an appraisal of the Proposer's current financial condition.

The date of any voluntary or involuntary bankruptcy judgments against any principal having an interest in this proposal are as follows:

5. CLAIMS HISTORY

- A. Has any claim (whether mediated, arbitrated or litigated) been made against your company in the past five years? Yes ___ No ___
- B. Has your company made any claim (whether mediated, arbitrated or litigated) against any City or client in the past five years? Yes ___ No ___
- C. If you checked "yes" to Sections (A) and/or (B) above, describe the claims using the format below: (use additional sheets if necessary)

Project Name _____

Claim Amount _____

Other party Contact _____

Name & Phone) _____

If more than one (1), describe on additional sheet (see **ADDITIONAL PAGES** below)

6. COMPLETION OF WORK BY SURETY

Has a surety ever completed any portion of a construction contract of your company with the last five years? Yes ___ No ___. If yes, provide an explanation below:

Project Name _____

Surety Contact (Name and Phone) _____

Date Surety Took Over _____

Explanation _____

If more than one (1), describe on additional sheet (see **ADDITIONAL PAGES** below).

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
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PROPOSERS QUESTIONNAIRE CONTINUED

7. CONTRACT TERMINATION

Has your company ever been terminated by a City or client, or rejected from proposing/bidding on a public works project in the last five years? Yes ____ No ____ . If yes, provide an explanation below:

Project Name _____

City/Client Contact _____

Contact Name _____

Contact Phone # _____

Date of Termination/Rejection _____

Explanation _____

Project Name _____

City/Client Contact _____

Contact Name _____

Contact Phone # _____

Date of Termination/Rejection _____

Explanation _____

If more than two (2), describe on additional sheet (see **ADDITIONAL PAGES** below)

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 15 of 18**

PROPOSERS QUESTIONNAIRE CONTINUED

8. PROJECT REFERENCES

The Proposer shall provide evidence that the Proposer has had the prior experience to properly perform in accordance with the terms of these Proposal Documents.

The following is a list of a minimum of three (3) of the most recent projects for which the Proposer has completed work of similar size and complexity as the General (or Prime) Contractor, and the names and phone numbers of the contracting agencies/clients.

No.	Date Completed	Agency/Client Name & Phone	Project Name & Description of Work	Contract Amount
1.				
2.				
3.				
4.				
5.				
6.				
7.				

If additional room is needed describe on additional sheet (see **ADDITIONAL PAGES** below)

**WO-XX-TBD
EXHIBIT "I"
FORMS AND CERTIFICATIONS
Page 18 of 18**

PROPOSERS QUESTIONNAIRE CONTINUED

11. SIGNATURES

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

Legal name of Proposer (Type or Print)

Print Name: _____ Title: _____

Signed by: _____

WO-XX-TBD
EXHIBIT “J”
PERFORMANCE AND PAYMENT BONDS
Page 1 of 9

See Attached

PERFORMANCE BOND

(San Marcos Training Tower, WO-XX-TBD)

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the City of San Marcos (Agency) has awarded and _____, (Contractor) is about to execute an Owner-Contractor Agreement (Agreement) for the above referenced Project and the terms of the Contract Documents comprising the Contract between the Agency and _____, the Contractor, of which the Agreement is a part, require the furnishing of a bond with the Contract providing for the faithful performance of the Contract by the Contractor.

NOW, THEREFORE, WE _____, as Contractor, and _____, as Surety, are held and firmly bound unto the City of San Marcos, as Agency, in the penal sum of _____ Dollars (\$ _____) plus costs outlined below, lawful money of the United States of America, said sum being one hundred percent (100%) of the estimated amount payable by Agency under the terms of the Contract, for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounden Contractor shall in all things stand to and abide by, and well and truly keep and perform each, every and all of the terms, covenants, conditions and agreements in the Contract (including, without limitation, completion within the time specified of all work under the Contract and performance of Contractor's warranty obligations and obligations for the correction of defective or nonconforming work) for the period of three hundred sixty-five [365] days following acceptance of the Work under Contract by Agency provided on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless Agency, its officers and agents from any and all costs, damages, penalty or expenses including attorney fees which Agency may incur by reason of Contractor failing to perform each and every and all terms, as therein stipulated, then this obligation shall become null and void; otherwise it shall remain in full force and effect in favor of Agency.

In the event of default by Contractor, Surety shall promptly remedy the default, or shall promptly do one of the following at Agency's election:

1. Undertake through its agents or independent contractors, reasonably acceptable to Agency, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Contractor under the Contract including without limitation all obligations with respect to warranties, guarantees and the payment of liquidated damages.
2. Reimburse Agency for all costs Agency incurs in completing the Contract and in correcting, repairing or replacing any defects in materials or workmanship or materials and workmanship which do not conform to the Specifications.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by Agency in successfully enforcing such obligation, all included in any judgment rendered.

It is a condition hereof that any change, alteration, modification or amendment of any nature whatsoever that may be made in the terms of the Contract, or in the character or scope of the Work to be performed, the

method of performance, or in the time of completion thereof under the Contract, whether made under express agreement or not, may be made without notice to Surety and without affecting the obligation of Surety on this bond and without requiring the consent of Surety, and no such change or changes shall release Surety from any of its obligations hereunder. Surety hereby consents to and waives notice of any such change, alteration, modification or amendment.

The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this bond and notice to Surety is not required for such increased obligation.

Surety acknowledges that a claim under this bond may be made at any time until all applicable State statute of limitation periods have expired.

Contractor and Surety shall not be liable to Agency unless Agency has performed the obligations to the Contractor in accordance with the terms of the contract. Contractor and Surety shall not be liable to Agency in the aggregate in excess of the penal sum and costs, expenses and fees stated above.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, powers, legal capacity and authority to enter into and execute this document on behalf of the above bounden Contractor and Surety, and have caused this document to be executed by setting hereunto their names, titles and signatures this _____ day of _____, 20__.

CONTRACTOR

SURETY

Name: _____

Name: _____

By: _____

By: _____

By: _____

By: _____

Address:

Address:

Telephone

Telephone

Notary Acknowledgements of Contractor and Surety Must be Attached

Notice of Instructions to Principal and Surety:

1. Principal's signature with title must be property notarized (i.e., proprietorship, partnership, corporation, joint venture). If corporation, affix seal.
2. In the event Contractor is a Corporation, the signatures of two separate persons holding different offices must be provided.
3. Signature of Attorney-in-Fact for Surety must be properly notarized.

4. Attach certified copy of Power of Attorney for Surety's Attorney-in-Fact.
5. If bond is executed in excess of Surety company's treasury limit, evidence of how bond was reinsured must be attached over signature of Attorney-in-Fact.

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Diego

On _____, before me, _____, Notary Public, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

SIGNATURE _____

PLACE NOTARY SEAL ABOVE

PAYMENT BOND

(San Marcos Training Tower, WO-XX-TBD)

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the City of San Marcos (Agency) has awarded and _____, (Contractor) is about to execute an Owner-Contractor Agreement (Agreement) for the above referenced Project and the terms of the Contract Documents comprising the Contract between the Agency and _____ the Contractor, of which the Agreement is a part, require the furnishing a payment bond upon the terms and conditions set forth herein.

NOW, THEREFORE, WE _____, as Contractor, and _____, as Surety, are held and firmly bound unto the City of San Marcos, as Agency, in the penal sum of _____ Dollars (\$ _____), lawful money of the United States of America, such sum being one hundred percent (100%) of the estimated amount payable by Agency under the terms of the Contract, for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the Contractor or any of its subcontractors shall fail to pay for any materials, provisions, provender or other supplies or teams used in, upon, for or about the performance of the Work contracted to be done; or for any work or labor thereon of any kind or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over the Employment Development Department from the wages of employees of the Contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor that the Surety will pay for the same, and also, in case suit is brought upon the Bond, a reasonable attorney's fee, to be fixed by the court. This Bond shall inure to the benefit of any of the person named in Civil Code Section 3181 so as to give a right of action to such person or their assigns in any suit brought upon the Bond.

It is further stipulated and agreed that the Surety on this Bond shall not be exonerated or released from the obligation of this Bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any of the Contract Documents pertaining or relating to any scheme or work of improvement hereinabove described or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement hereinabove described, nor by any rescission or attempted rescission of the Contract, Agreement or Bond, not by any conditions precedent or subsequent in the Bond attempting to limit the right of recovery of claimants otherwise entitled to recover under the Contract Documents or under this Bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the Bond and that this Bond be construed most strongly against the Surety and in favor of all persons for whose benefit such Bond is given, and under no circumstances shall Surety be released from liability to those for whose benefits such Bond has been given, by reason of any breach of Contract between Agency and Contractor, and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, powers, legal capacity and authority to enter into and execute this document on behalf of the above bounden Contractor and Surety, and have caused this document to be execute by setting hereunto their names, titles, and signatures this _____ day of _____, 20__.

CONTRACTOR

SURETY

Name: _____

Name: _____

By: _____

By: _____

Name: _____

By: _____

Address:

Address:

Telephone:

Telephone:

Notary Acknowledgements of Contractor and Surety Must be Attached

Notice of Instructions to Contractor and Surety:

1. Contractor's signature with title must be properly notarized (i.e., proprietorship, partnership, corporation, joint venture). If corporation, affix seal.
2. In the event Contractor is a Corporation, the signatures of two separate persons holding different offices must be provided.
3. Signature of Attorney-in-Fact for Surety must be properly notarized.
4. Attach certified copy of Power of Attorney for Surety's Attorney-in-Fact, dated within 5 working days of the date of the signature of the Attorney-in-Fact for Surety.
5. If bond is executed in excess of surety company's treasury limit, evidence of how bond was reinsured must be attached over signature of Attorney-in-Fact.

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of San Diego

On _____, before me, _____, Notary Public, personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

SIGNATURE _____

PLACE NOTARY SEAL ABOVE



5. OWNER FURNISHED DOCUMENTS – San Marcos Training Tower, 186 Santar Place

Scope of Work drawings attached hereto:

Item Number	Item Title	Item Producer	Item Date
1	Canopy Repaint	PBK-WLC	11/01/21
2	Masonry Wall Crack Repair	PBK-WLC	11/01/21
3	Guardrail Repair	PBK-WLC	11/01/21
4	CMU Wall Cap Repair	PBK-WLC	11/01/21
5	High Temperature Lining System Installation	PBK-WLC	11/01/21
6	Burn Room Floor Plan	PBK-WLC	11/01/21
7	Burn Room Reflected Ceiling Plan	PBK-WLC	11/01/21
8	Burn Room Section A	PBK-WLC	11/01/21
9	Burn Room Elevations	PBK-WLC	11/01/21
10	Burn Room Elevations	PBK-WLC	11/01/21
11	Burn Room Detail A Installation	PBK-WLC	11/01/21
12	Attachment 1	Various - see below	11/01/21
n/a	Results of Structural Site Review (16 pages)	R. M. Byrd and Associates, Inc.	05/12/21
09 90 00	Painting Specification (9 pages)	PBK-WLC	Dec 2018
11 95 11	High Temperature Lining Systems Specification (5 pages)	PBK-WLC	12/16/18
n/a	Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary (19 pages)	R. M. Byrd and Associates, Inc.	11/01/21
n/a	SikaGrout-428FS Product Data Sheet (5 pages)	Sika Corporation	Nov 2020

Proposal Form (Lump Sum Pricing) for San Marcos Training Tower dated January 26, 2022 - one (1) page

Above items, Pre-Submittal Meeting Minutes, RFP addendum, and any TBD future items can be found here:

<https://spaces.hightail.com/space/F7ZqlgofEo>



Roof Deck Canopy



Canopy/ Roof Deck (Level 5)

A

B

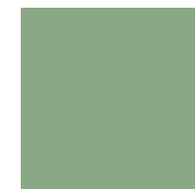


KEY PLAN

KEYNOTES

- A** Repaint, color selected by Architect, typ.
- B** Rust mitigation required, typ.

Notes:
 1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
 2. Reference Specification Section 09 90 00 - Painting - Attachment 1.



Dunn Edwards
 DE5641 "Mermaid's Cove"
 Color Selected



Canopy East View



Canopy South View



Burn room exterior



A



A



A

CMU crack detail



KEY PLAN

KEYNOTES

- A** Remove and replace two levels of 8" face shells on the East and South walls (11 and 12 courses).
- B** Extent of repair up to control joint.

Notes:
 1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.



Burn room exterior



CMU Color Selected

Angelus Block
 "Greystone" Split Face

A

B

San Marcos Training Tower

Masonry Wall Crack Repair | 11/01/2021 | 02





Upper Level guardrail

B



Detail view of rusted post embedment

A



KEY PLAN



Detail view of rusted post embedment

A

KEYNOTES

- A Rust mitigation - remove all rust and paint with proper galvanize coating at all post. Remove all existing grout/epoxy adhesive from all post embedments and prepare/apply non-shrink grout (SikaGrout®), typ.
- B Extent of work - West and South side of guardrails at upper level (adjacent to platform) and East and South side of guardrails at stair landing.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.

2. Reference SikaGrout® - 428 FS - Attachment 1.



Detail view of CMU wall



Detail view of CMU wall



KEY PLAN



Overall view of CMU wall



Angelus Block
"Natural Gray" Precision

CMU Wall Cap Color Selected

KEYNOTES

- A Clean and prepare surface for new CMU wall cap.



Current interior view of Burn Room



Current interior view of Burn Room



KEY PLAN 



Current interior view of Burn Room



Proposed new high temperature lining system

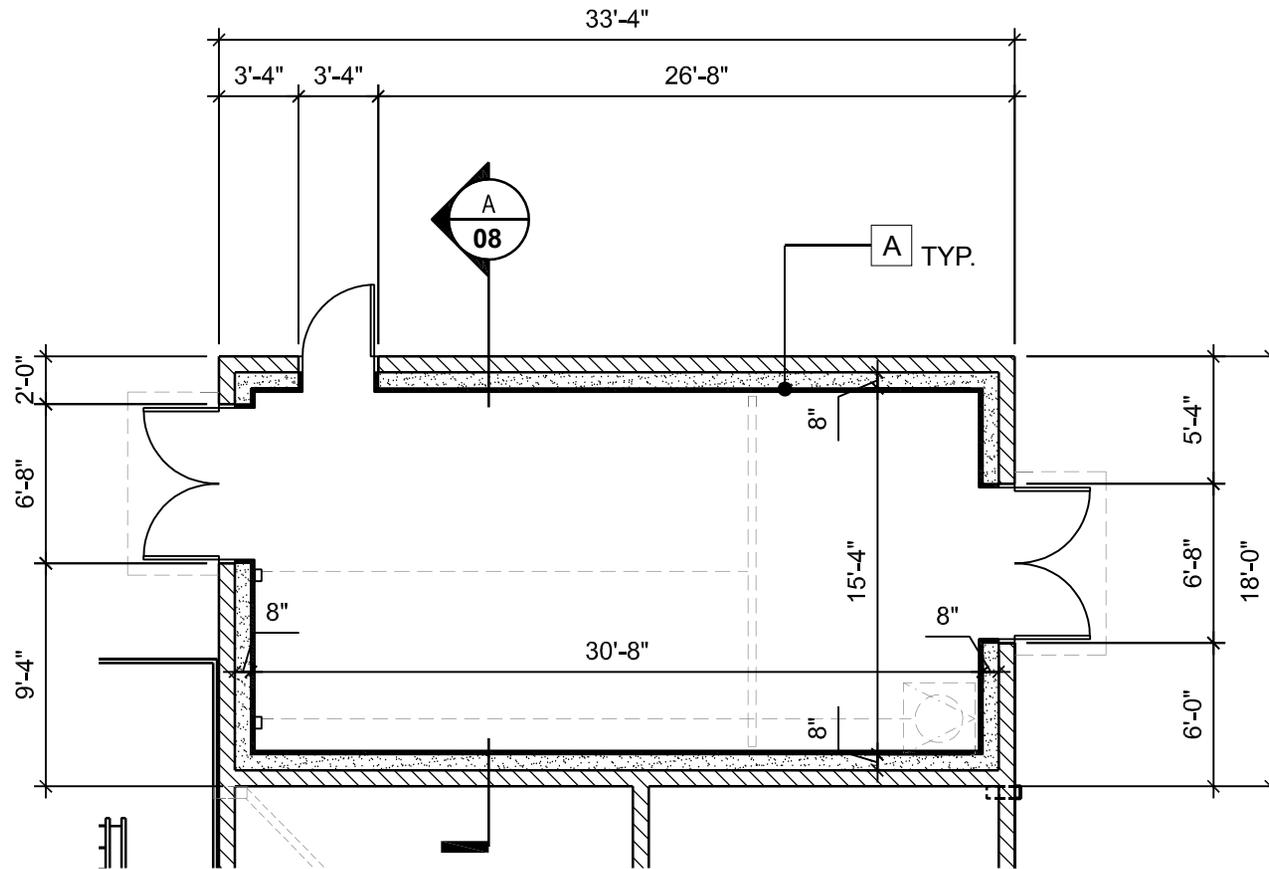
KEYNOTES

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.



KEY PLAN 



KEYNOTES

- A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

Scale: 1/8" = 1'-0"



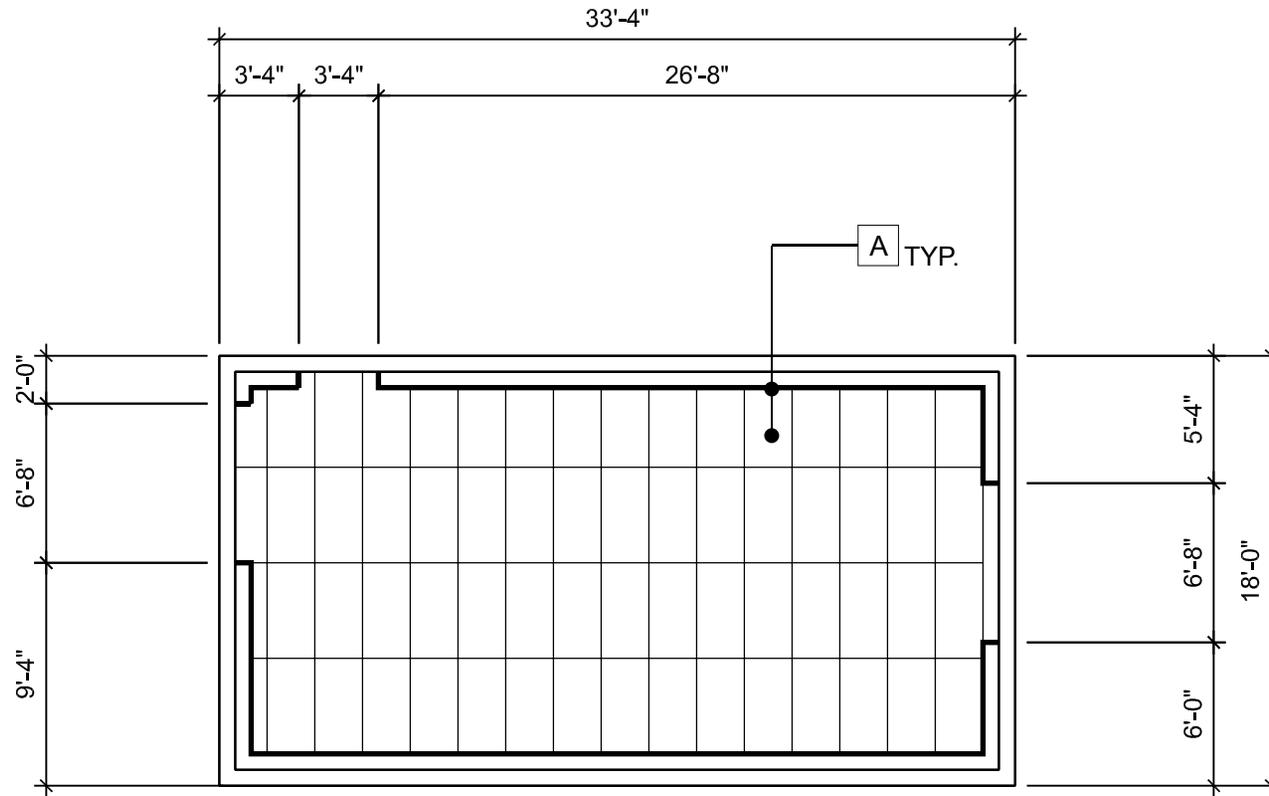
San Marcos Training Tower

Burn Room Floor Plan | 11/01/2021 | 06





KEY PLAN 



KEYNOTES

- A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

- Notes:
1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
 2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
 3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

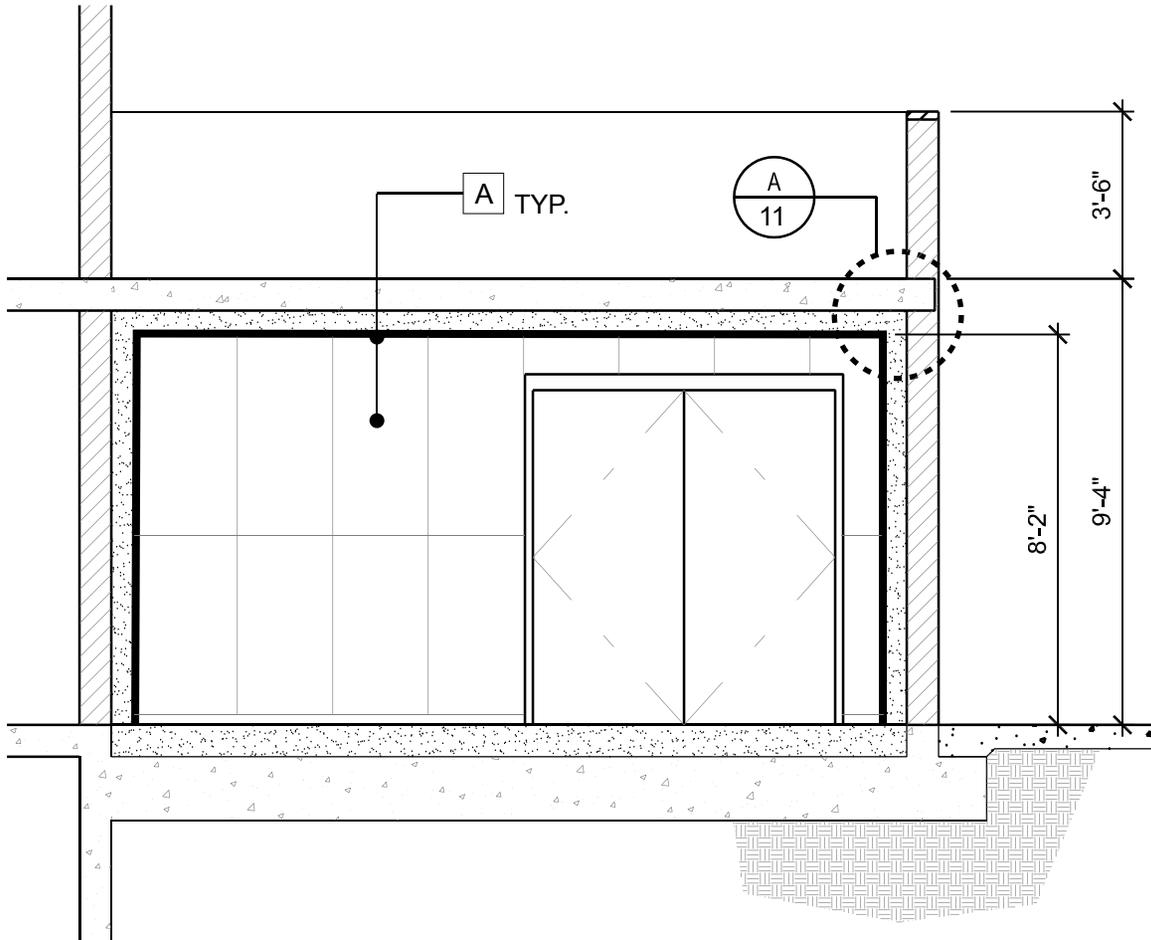
Scale: 1/8" = 1'-0"



San Marcos Training Tower

Burn Room Reflected Ceiling Plan | 11/01/2021 | 07





Scale: 1/4" = 1'-0"



KEY PLAN 

KEYNOTES

A (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

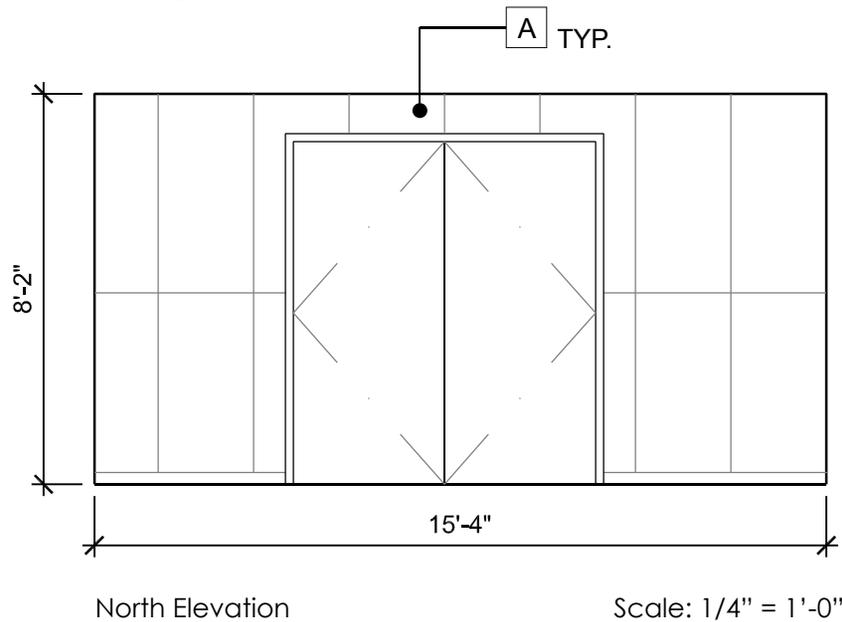
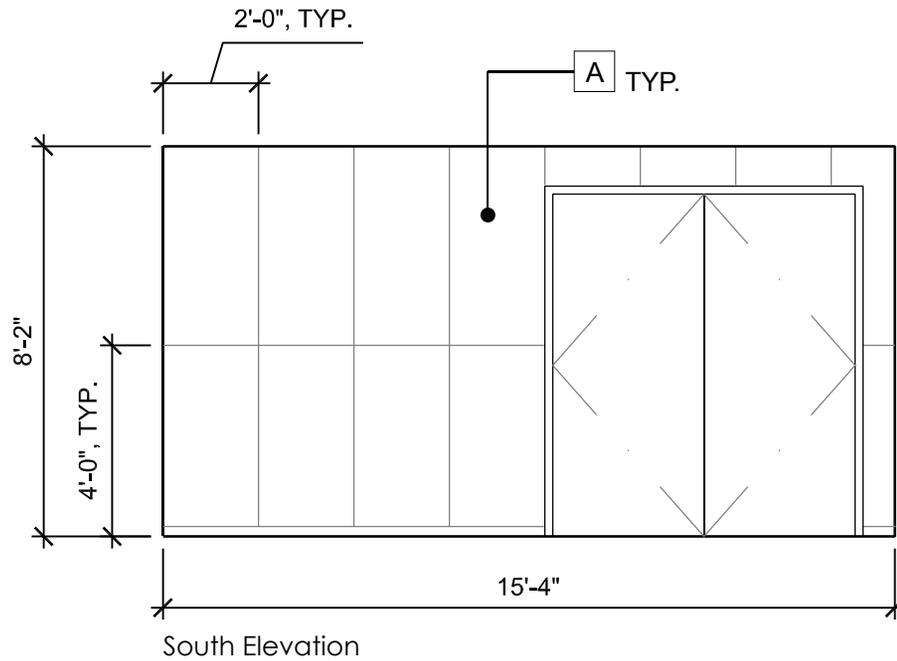
Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

San Marcos Training Tower

Burn Room Section A | 11/01/2021 | 08





Scale: 1/4" = 1'-0"



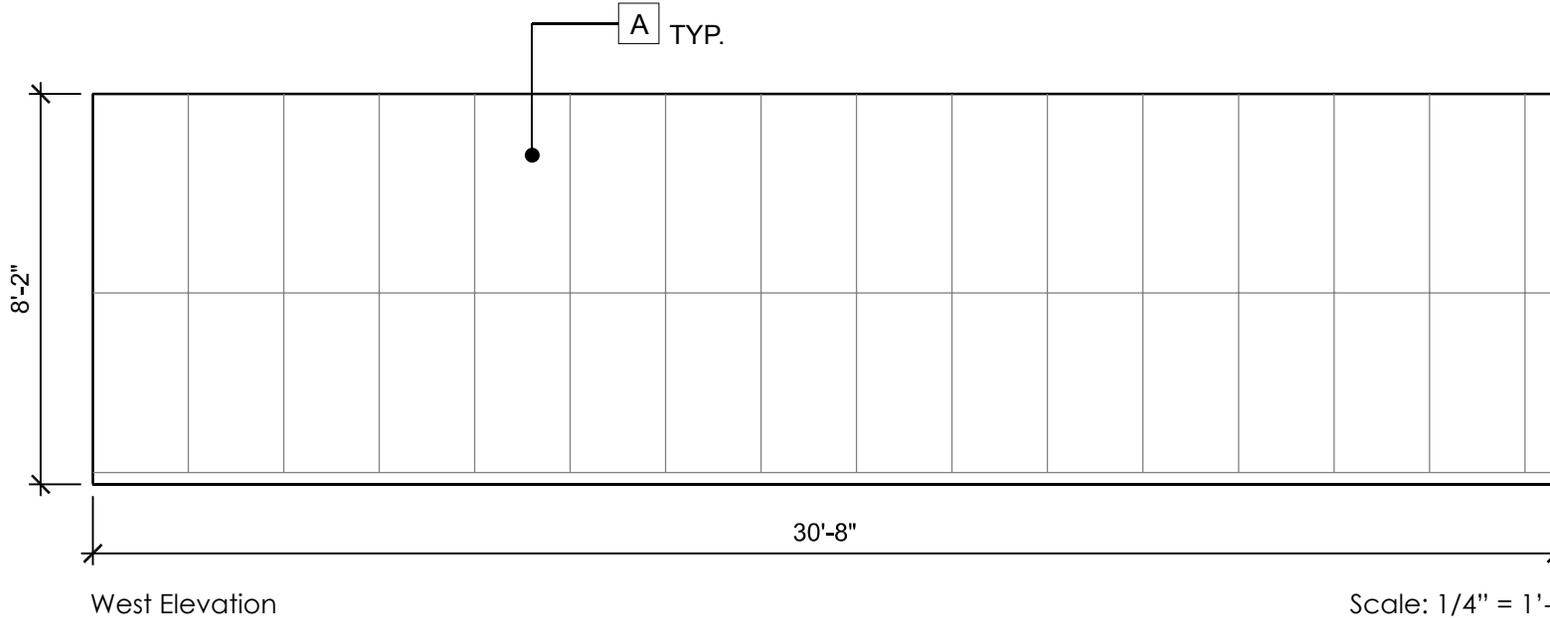
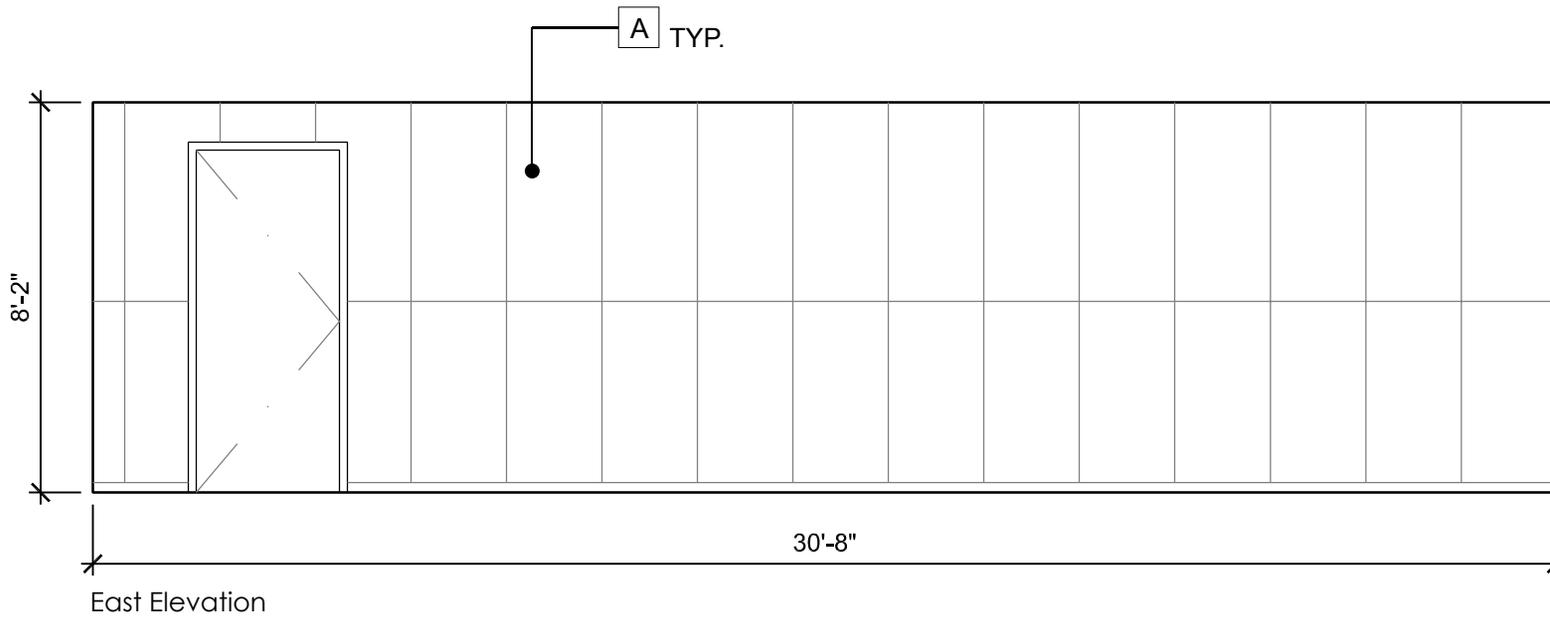
KEY PLAN 

KEYNOTES

- A** (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.



Scale: 1/4" = 1'-0"



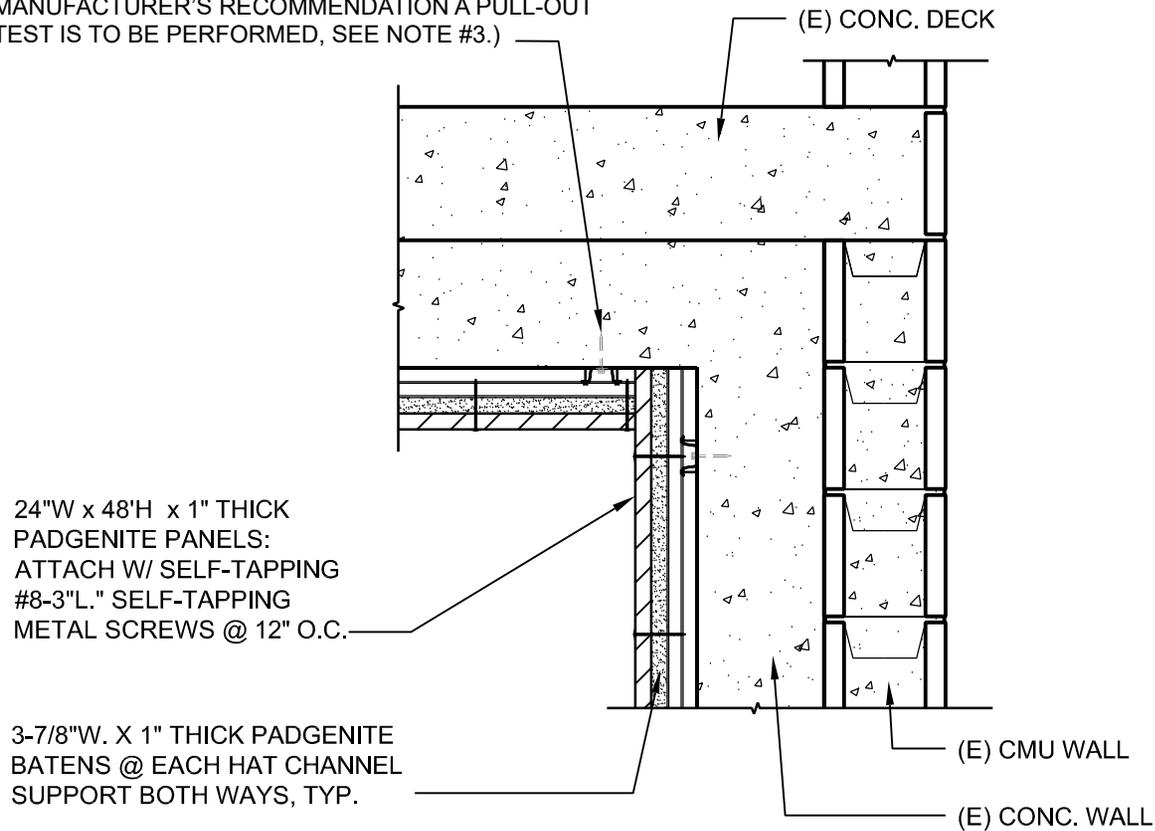
KEY PLAN

KEYNOTES

- A** (N) High Temperature Lining Panels
@ Walls, Ceiling and Doors/Frames, typ.

- Notes:
1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
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7/8" x 18GA. GALV. HAT CHANNEL AT 48" O.C., ATTACH W/ 3/8" x 3-1/2" CONC. FASTENERS (PER THE MANUFACTURER'S RECOMMENDATION A PULL-OUT TEST IS TO BE PERFORMED, SEE NOTE #3.)



24"W x 48"H x 1" THICK PADGENITE PANELS: ATTACH W/ SELF-TAPPING #8-3"L." SELF-TAPPING METAL SCREWS @ 12" O.C.

3-7/8"W. X 1" THICK PADGENITE BATENS @ EACH HAT CHANNEL SUPPORT BOTH WAYS, TYP.

KEYNOTES

Notes:

1. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Results of Structural Site Review" report for more info. - Attachment 1.
2. Reference Specification Section 11 95 11 - High Temperature Lining System - Attachment 1.
3. Reference the R.M. BYRD and Associates, Inc. Structural Engineer's "Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary" report for more info. - Attachment 1.

NOTE: THE CONTRACTOR IS TO PROVIDE SHOP DRAWINGS AND ENGINEERED DETAILS FOR PADGENITE PANELS (WALLS, CEILING, DOOR AND FRAMES, ETC.).

ATTACHMENT 1

- R.M. Byrd and Associates, Inc. - Results of Structural Site Review
- Section 09 90 00 - Painting
- Section 11 95 11 - High Temperature Lining Systems
- R.M. Byrd and Associates, Inc. - Addition of Padgenite Panels to Burn Room Structural Fasteners Commentary
- SikaGrout® - 428 FS



May 12, 2021

City of San Marcos
c/o IDS Real Estate Group
629 J Street, Suite 204
San Diego, CA 92101

Attention: Hannah Schraeger, Associate
Subject: San Marcos Training Tower
Re: Results of Structural Site Review

Dear Mrs. Schraeger,

Per the request of the City of San Marcos, RM Byrd and Associates performed a site review of the existing San Marcos Fire Training Tower. The review is for general structural field conditions and identification of identifiable deleterious conditions or effect, in accordance with NFPA review requirements.

The review was performed by Rick Byrd, S.E, on April 1st, 2021. The original Training Tower was designed by RM Byrd in 2000.

Each level was reviewed for visible signs of deterioration or impacts of tire training activity on the structural components.



Roof Deck and Canopy (Level 5) (Photo 2, 3)

The upper roof deck and canopy condition is considered “good”. The canopy structure indicates signs of rust, which will require mitigation of the rust and new paint to assure continued long range performance. Current level of rust does not appear to impact structural integrity of metal deck or structural steel. The steel column yoke assemble to the East has an apparent beehive inside the structural steel HSS horizontal member, which shall be mitigated.

Concrete roof deck condition at level 5 appears excellent.

Training Levels 2, 3 and 4.

The condition of masonry walls, concrete floors and structural steel stair components is excellent and indicative of the excellent maintenance procedures in place. Roof of Level 4 indicates no signs of adverse conditions.

At handrail embeds there is very minor rust indication at the concrete handrail embed at exterior slab, which shall have the rust removed and re-painted to prevent any long term impact of rust and subsequent

concrete spalling. (Photo 4) This is a common issue on training towers, and all exposed handrail embeds in concrete slab will benefit from continued rust mitigation and paint at these conditions. (Photo 5)

Exterior masonry at levels 2, 3 and 4 appears excellent with no significant deleterious indicators.

Training Level 1

Training level 1 outside the burn room area is noted as “good”, with no deleterious indicators. (Photo 6)

The Burn Room Training activity of Level 1 is limited to the dedicated burn room, ground floor, East side. The structural protection from fire activity is provided by trowel on Refractory Concrete. The refractory concrete had spalled in some instances, and protection of the structure is impacted. (Photos 7 and 8). The heat effects on the east masonry wall have apparently caused a longitudinal, continuous horizontal crack in the masonry, which traverses two levels of 8” face shells. The extent of the crack is the full length of the East, with a minor return on the South side. (Photos 9-18)

Repair of the masonry crack is required, and the process is defined in Attachment 1. The crack repair involves removing the face shells at the building exterior, pressure injecting the crack with epoxy as a structural repair, and replacing the face shells with an epoxy application. The extent of removal, color and material selection of the replacement face shells shall be by the architect.

It is recommended that the burn room be considered for the application of High Temperature Lining, which has greater effective protection of structural surfaces than the Refractory Concrete. This is currently a popular retrofit for Training Towers with similar application.

Should you have any questions or require additional information please do not hesitate to contact our office.

Sincerely,



Rick Byrd, S.E.
President





Photo 1



Photo 2



Photo 3





Photo 4



Photo 5



Photo 6





Photo 7



Photo 8

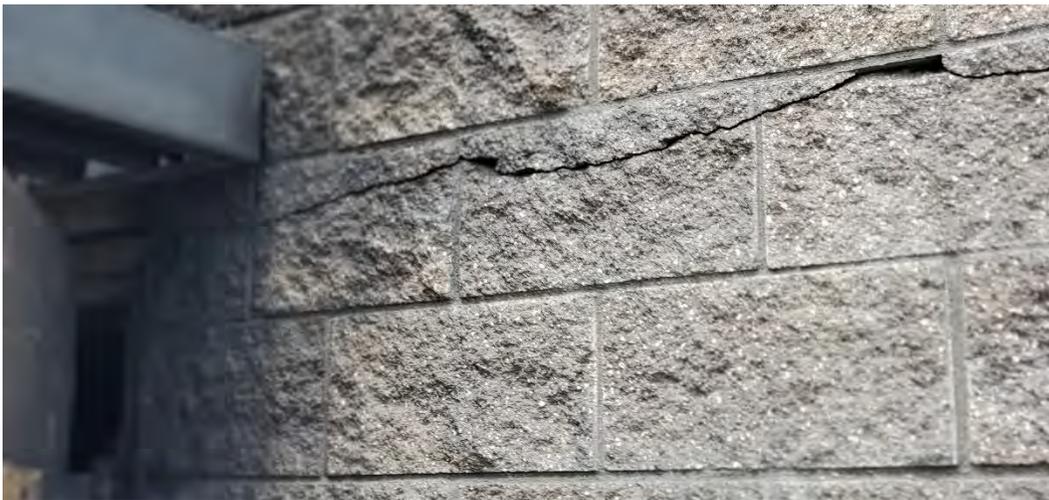


Photo 9





Photo 10



Photo 11



Photo 12





Photo 13



Photo 14



Photo 15





Photo 16



Photo 17

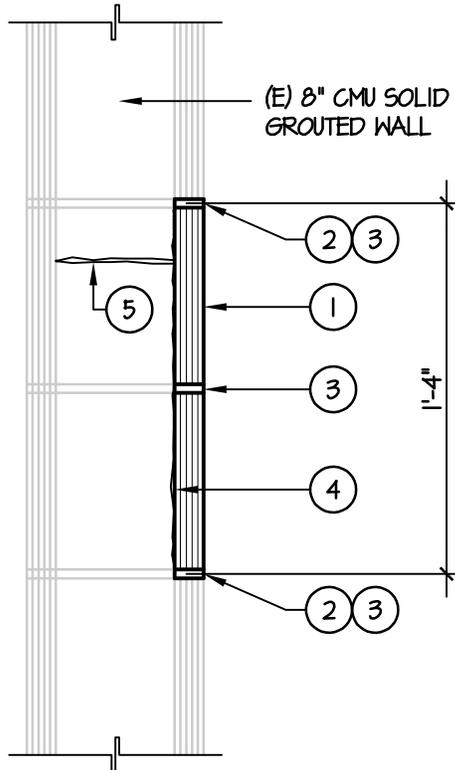


Photo 18



ATTACHMENT 1





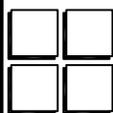
- ① REMOVE TWO COURSES OF FACE SHELL TO A MAXIMUM THICKNESS OF 1 5/8". PROVIDE REPLACEMENT FACE SHELL AS DIRECTED BY ARCHITECT.
- ② REMOVE MORTAR AT EXISTING JOINT AT TOP AND BOTTOM OF NEW FACE SHELLS.
- ③ PROVIDE REPLACEMENT EPOXY MORTAR FULL DEPTH OF MORTAR JOINT, ALL HORIZONTAL AND VERTICAL JOINTS (SIKADUR 32 OR EQUIVALENT)
- ④ PROVIDE SIKA EPOXY BASED BONDING ADHESIVE, SUCH AS SIKADUR 32 OR EQUIVALENT. SUBMIT ANY ALTERNATE TO ENGINEER FOR APPROVAL. SURFACE TO BE PREPARED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- ⑤ EXISTING CRACK IN MASONRY WALL TO BE REPAIRED WITH PRESSURE INJECTED EPOXY. PROCESS TO BE EXECUTED BY A COMPANY WITH MINIMUM 5 YEARS OF EXPERIENCE IN MASONRY AND CONCRETE WALL PRESSURE INJECTION CRACK REPAIR. PRODUCT SHALL BE SIKADUR 52 OR EQUIVALENT. SUBMIT ANY ALTERNATE TO ENGINEER FOR APPROVAL.



MASONRY WALL CRACK REPAIR

R.M. BYRD AND ASSOCIATES INC.

Consulting Structural Engineers



1047 WEST SIXTH STREET, SUITE A
 ONTARIO, CA. 91762
 Phone: (909) 983-5599
 Fax: (909) 983-4456
 WWW.RMBYRD.COM

JOB NO. : JOBNO 90-1039

SAN MARCOS TRAINING FACILITY

Sikadur® 52

Advanced, very-low-viscosity,
moisture-tolerant epoxy injection adhesive

Description	Sikadur® 52 is a 2-component, 100% solids, moisture-tolerant, epoxy adhesive. It is a low-viscosity, high-strength adhesive formulated specifically for grouting both dry and damp cracks. It conforms to the current ASTM C-881, Types I and II, Grade-1, Class C and AASHTO M-235 specifications.
Where To Use	<ul style="list-style-type: none"> ■ Use neat for gravity feed or pressure injection of cracks in structural concrete, masonry, wood, etc. ■ Seal interior slabs and exterior above grade slabs from water, chlorides and mild chemical attack and to improve wearability.
Advantages	<ul style="list-style-type: none"> ■ Tenacious crack-sealing grout. ■ Convenient easy mix ratio A:B = 2:1 by volume. ■ Advanced low-viscosity structural resin. ■ Unique, high-strength adhesive for 'can't dry' cracks.
Coverage	1 gal. yields 231 cu. in.
Packaging	3 gallons units.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	2 years in original, unopened containers		
Storage Conditions	Store dry at 40°-95°F (4°-35°C). Condition to 65°-75°F (18°-24°C) before using.		
Color	Clear, pale yellow.		
Mixing Ratio	Component 'A': Component 'B' = 2:1 by volume.		
Viscosity (Mixed)	Approximately 200 cps.		
Pot Life	Approximately 30 minutes. (60 gram mass)		
Tensile Properties (ASTM D-638)			
14 day	Tensile Strength	7,900 psi (54 MPa)	
	Elongation at Break	3.1%	
	Modulus of Elasticity	2.0 X 10 ⁵ psi (1,400 MPa)	
Flexural Properties (ASTM D-790)			
14 day	Flexural Strength (Modulus of Rupture)	5,400 psi (37.2 MPa)	
	Tangent Modulus of Elasticity in Bending	3.8 X 10 ⁵ psi (2,620 MPa)	
Shear Strength (ASTM D-732)	14 day	Shear Strength	4,300 psi (29.6 MPa)
Bond Strength (ASTM C-882): Hardened Concrete to Hardened Concrete			
2 day (dry cure)	Bond Strength	3,000 psi (20.6 MPa)	
14 day (moist cure)	Bond Strength	2,200 psi (15.1 MPa)	
Heat Deflection Temperature (ASTM D-648)			
14 day	122°F (50°C)	[fiber stress loading = 264 psi (1.8 MPa)]	
Water Absorption (ASTM D-570)	7 day	(2 hour boil)	1.5%
Compressive Properties (ASTM D-695)			
Compressive Strength, psi (MPa)			
	40°F* (4°C)*	73°F* (23°C)*	90°F* (32°C)*
8 hour	-	-	90 (0.62)
16 hour	-	3,000 (20.6)	7,300 (50.3)
1 day	-	4,500 (31.0)	8,400 (57.9)
3 day	1,800 (12.4)	10,000 (68.9)	8,700 (60.0)
7 day	6,100 (42.0)	11,300 (77.9)	10,400 (71.7)
14 day	6,800 (46.8)	11,700 (80.6)	10,400 (71.7)
28 day	8,400 (57.9)	12,000 (82.7)	10,400 (71.7)

Construction



PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

PRODUCT DATA SHEET

Sikadur[®]-32 Hi-Mod

High-modulus, high-strength, epoxy bonding/grouting adhesive

PRODUCT DESCRIPTION

Sikadur[®]-32 Hi-Mod is a multi-purpose, 2-component, 100 % solids, moisture-tolerant structural epoxy adhesive. It conforms to the current ASTM C-881 Types I, II, and V, Grade 2, Class C and AASHTO M-235 specifications.

USES

Sikadur[®]-32 Hi-Mod may only be used by experienced professionals.

- Bond fresh, plastic concrete to hardened concrete and steel.
- Grout horizontal cracks in structural concrete and wood by gravity feed.
- Machinery and 'robotic' base-plate grout.
- Structural adhesive for concrete, masonry, metal, wood, etc.

CHARACTERISTICS / ADVANTAGES

- High-strength bonding/grouting adhesive.
- Tolerant to moisture before, during and after cure.
- Excellent adhesion to most structural materials.
- Convenient easy-to-mix ratio A:B = 1:1 by volume.
- Easy-to-use for bonding/grouting applications.
- Fast initial set; rapid gain to ultimate strengths.
- USDA-certified for use in food plants.

PRODUCT INFORMATION

Chemical Base	100 % epoxy	
Packaging	1, 2 and 4 gal. units	
Color	Concrete gray	
Shelf Life	2 years in original, unopened containers	
Storage Conditions	Store dry at 40–95 °F (4–35 °C). Condition material to 65–75 °F (18–24 °C) before using.	
Viscosity	Approximately 4–5,000 cps.	
Water Absorption	0.21 % (7 days, 24 h immersion)	(ASTM D-570) 73 °F (23 °C) 50 % R.H.

TECHNICAL INFORMATION

Compressive Strength	40 °F*	73 °F*	90 °F*	(ASTM D-695)
	(4 °C)	(23 °C)	(32 °C)	
8 hour	-	140 (1.0)	1,700 (11.7)	
16 hour	-	4,800 (33.1)	7,300 (50.3)	
1 day	30.0 (0.2)	5,700 (39.3)	7,300 (50.3)	
3 day	5,300 (36.6)	11,300 (77.9)	10,400(71.7)	
7 day	9,600 (66.2)	11,800 (81.4)	10,400(71.7)	
14 day	11,900 (82.1)	12,200 (84.1)	10,400(71.7)	
28 day	12,600 (86.9)	12,200 (84.1)	10,500(72.4)	
*Material cured and tested at the temperatures indicated.				
Modulus of Elasticity in Compression	2.1 x 10 ⁶ psi (1,449 MPa) (7 days)			(ASTM D-695) 73 °F (23 °C) 50 % R.H.
Flexural Strength	7,000 psi (48.3 MPa) (14 day)			(ASTM D-790) 73 °F (23 °C) 50 % R.H.
Modulus of Elasticity in Flexure	6.0 x 10 ⁵ psi (4,800 MPa) (14 day)			(ASTM D-790) 73 °F (23 °C) 50 % R.H.
Tensile Strength	6,900 psi (48 MPa) (7 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Tensile Modulus of Elasticity	5.4 x 10 ⁵ psi (3,726 MPa) (14 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Elongation at Break	1.9 % (7 days)			(ASTM D-638) 73 °F (23 °C) 50 % R.H.
Tensile Adhesion Strength	2 day (moist cure)	Plastic Concrete to	1,700 psi	(ASTM C-882) 73 °F (23 °C) 50 % R.H.
		Hardened	(11.7 MPa)	
		Concrete		
	14 day (moist cure)	Hardened	2,000 psi	
		Concrete to	(13.8 MPa)	
		Hardened		
Concrete	Hardened	1,900 psi		
	Concrete to Steel	(13.1 MPa)		
	Hardened			
Concrete	Plastic Concrete to	2,200 psi		
	Hardened	(15.1 MPa)		
	Concrete			
Concrete	Hardened	2,000 psi		
	Concrete to	(13.8 MPa)		
	Hardened			
Concrete	Hardened	2,000 psi		
	Concrete to Steel	(13.8 MPa)		
	Concrete			

Shear Strength	6,200 psi (43 MPa) (14 days)			(ASTM D-732) 73 °F (23 °C) 50 % R.H.
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APPLICATION INFORMATION

Mixing Ratio	Component 'A': Component 'B' = 1:1 by volume
Coverage	Bonding Adhesive: 1 gal. covers approximately 80 ft ² on smooth surface. Base Plate Grout: 1 gal. mixed with 1.5 parts oven-dried aggregate by loose volume yields approximately 420 in ³ of grout. Anchoring Grout: 1 gal. yields 231 in ³ of grout.
Product Temperature	Condition material to 65°-75°F (18°-24°C) before using.
Ambient Air Temperature	Minimum ambient temperature 40°F (4°C).
Substrate Temperature	Minimum substrate temperature 40°F (4°C).
Pot Life	Approximately 30 minutes. (60 gram mass) Approximately 22 minutes. (350 gram mass)
Contact Time	40 °F (4 °C)*: 15–16 h 73 °F (23 °C)*: 2–2.5 h 90 °F (32 °C)*: 1.5–2 h <small>*Material cured and tested at the temperatures indicated.</small>

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants.

SUBSTRATE PREPARATION

Concrete - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blast cleaning or other equivalent mechanical means.

Steel - Should be cleaned and prepared thoroughly by blast cleaning or other equivalent mechanical means.

MIXING

Pre-mix each component. Proportion equal parts by volume of Component 'A' and Component 'B' into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400-600 rpm) drill until blend is a uniform color. Mix only that quantity that can be applied within its pot life.

APPLICATION METHOD / TOOLS

To bond fresh concrete to hardened concrete - Apply by brush, roller, broom or spray. Place fresh concrete while Sikadur® 32, Hi-Mod, is still tacky. If coating becomes glossy and loses tackiness, remove any surface contaminants then recoat with additional Sikadur® 32 Hi-Mod, and proceed.

To grout baseplates - Add up to 1 1/2 parts of oven-dried aggregate to 1 part of mixed Sikadur® 32, Hi-Mod, by volume. Place grout under baseplate. Avoid contact with the underside of the plate. A 1/4 to 3/8 in. (6 to 10

mm) space should remain between the top of the grout and the bottom of the plate.

Maximum thickness of grout per lift is 1.5 in. (38 mm) If multiple lifts are needed, allow preceding layer to cool to touch before applying additional layer. The remaining 1/4 to 3/8 in. (6 to 10 mm) space should be filled with neat Sikadur® 32 Hi-Mod. Pour a sufficient quantity of neat epoxy to allow the level to rise slightly higher than the underside of the bearing plate.

To gravity feed cracks - Pour neat material into vee-notched crack. Continue placement until completely filled.

Seal underside of slab prior to filling if cracks reflect through.

LIMITATIONS

- For spray applications, consult Technical Service at 800-933-7452.
- Use only oven-dry aggregate.
- Material is a vapor barrier after cure.
- For applications on exterior, on-grade substrates, consult Technical Services at 800-933-7452.
- Do not apply over wet, glistening surface.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

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Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



Product Data Sheet

Sikadur®-32 Hi-Mod
March 2020, Version 01.02
020204030010000129

Sale of SIKA products are subject to the Terms and Conditions of Sale which are available at <https://usa.sika.com/en/group/SikaCorp/termsandconditions.html> or by calling 1-800-933-7452.

Sikadur-32Hi-Mod-en-US-(03-2020)-1-2.pdf



SECTION 09 90 00

PAINTING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Products and application.
- C. Surface finish schedule.

1.2 SUMMARY OF PAINTED SUBSTRATES

- A. Section includes the application of paint systems on the following exterior substrates:
 - 1. Primed or unprimed steel.
 - 2. Steel roof deck.
- B. Substrate listings are for principal surfaces only. Refer to drawings, details and individual specification sections for items, surfaces, and substrates not specifically listed.

1.3 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. SSPC - The Society for Protective Coatings.

1.4 SYSTEM DESCRIPTION

- A. Preparation of all surfaces to receive final finish.
- B. Painting and finishing work of this section using coating systems of materials including primers, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- C. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- D. Painting and finishing all exterior and interior surfaces of materials including structural, mechanical, and electrical work on site, in building spaces, and above or on the roof.
- E. Paint exposed surfaces except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces.

1.5 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.6 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years documented experience.

- C. Coats: The number of coats specified is the minimum number acceptable. If full coverage is not obtained with the specified number of coats, apply such additional coats as are necessary to produce the required finish.
- D. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- E. Provide primers and undercoat paint produced by the same manufacturer as the finish coat.
- F. The minimum dry film thickness of each coat of paint shall comply with the manufacturer's recommendations for each type of paint used.

1.7 REGULATORY REQUIREMENTS

- A. Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this specification, comply with the more stringent provisions.
- B. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
- C. Comply with South Coast Air Quality Management District (SCAQMD) Rule 1113. A copy of this regulation can be obtained from <http://www.aqmd.gov/rules/reg/reg11/r1113.pdf>.
- D. In the South Coast Air Quality Management District (SCAQMD), where lower VOC contents are specified for a number of categories, certain products may be covered under the manufacturer's SCAQMD - approved Averaging Program. As a result, certain products may be fully compliant with SCAQMD Rule 1113, despite having VOC contents higher than specified limits.

1.8 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Product data for each coating type shall include as a minimum the following items. Listing shall be by manufacturer's catalog number:
 - 1. Solvent type.
 - 2. Resin type and percentage.
 - 3. Prime pigments by percent of weight.
 - 4. Reinforcing pigment by percent of weight
 - 5. Solids and volume by weight.
 - 6. VOC and RAVOC limits.
 - 7. Coverage rates and film thickness both wet and dry.
 - 8. Conformance to environmental standards listed.
 - 9. Surface preparation recommendations.
 - 10. Application, storage, clean up and disposal recommendations.
 - 11. Special instructions from the manufacturer for proper preparation and application.
- C. Provide manufacturer's technical information and instructions for application of each material proposed for use by catalog number.
- D. List each material by catalog number and cross-reference specific coating with specified finish system.

- E. Technical data sheets and all container labels must match and shall contain the same product identification numbers. The term "Series " is not acceptable.
- F. Provide manufacturer's written and signed certificate that products proposed meet or exceed specified materials.
- G. Submit samples under provisions of Section 01 33 00.
- H. Submit two samples 8-1/2 x 11 inch in size of each paint color and texture applied to cardboard. Resubmit samples until acceptable color, sheen and texture is obtained.
- I. On same species and quality of wood to be installed, submit two 4 x 8 inch samples showing system to be used for varnishes and stains.

1.9 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall surfaces and other exterior and interior components, duplicate specified finishes on at least 100 sq.ft. of surface area.
- C. Provide full-coat finishes until required coverage, sheen, color and texture are obtained.
- D. Simulate finished lighting conditions for review of field samples.
- E. After finishes are accepted, the accepted surface may remain as part of the work and will be used to evaluate subsequent coating systems applications of a similar nature.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and store and protect under provisions of Section 01 61 00.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing. Paint containers not displaying product identification will not be acceptable.
- D. Store paint materials at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain interior surface and ambient temperatures above 50 degrees F with a maximum humidity level of 50 percent for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 50 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Urethane Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 foot candles measured mid-height at substrate surface.

1.12 EXTRA MATERIAL

- A. Provide a one gallon unopened container of each color to Owner.
- B. Label each container with color, texture, and room locations in addition to the manufacturer's label.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PAINT

- A. Unless specifically identified otherwise, product designations included in this section are those that are manufactured and distributed by the Dunn-Edwards Corporation, www.dunnedwards.com and shall serve as the basis of design standard for kind, quality, performance and function.
- B. Subject to full compliance with specified requirements, other manufacturers offering equivalent products are:
 - 1. Behr Process Corp., www.behrpaint.com.
 - 2. Benjamin Moore Paints, www.benjaminmoore.com.
 - 3. Glidden Professional, www.gliddenprofessional.com.
 - 4. Kelly-Moore Paint Company, www.kellymoore.com.
 - 5. Pittsburgh Paints, www.ppg.com.
 - 6. Sherwin Williams, www.sherwin-williams.com.
 - 7. Tnemec Company, Inc., www.tnemec.com.
 - 8. Vista Paint Corporation, www.vistapaint.com.
- C. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. "Deep Tone" colors to be composed of 100 percent acrylic pigments with a colored base.
- D. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- E. Chemical Components of Interior Paints and Coatings: Shall not exceed the limitations of Green Seal's Standard GS-11 and SCAQMD Rule 1113 averaging method for VOC content and the following restrictions:
 - 1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
 - 2. Non-Flat Paints and Coatings: VOC content of not more than 50 g/L.
 - 3. Anticorrosive Coatings: VOC content of not more than 100 g/L.
 - 4. Varnishes and Sanding Sealers: VOC content of not more than 275 g/L.
 - 5. Stains: VOC content of not more than 250 g/L.
 - 6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

7. Silica Compounds: Paints and coatings, to include colorants, shall not contain any silica.
8. Restricted Components: Paints and coatings shall not contain any of the following:
 - (a) Acrolein.
 - (b) Acrylonitrile.
 - (c) Antimony.
 - (d) Benzene.
 - (e) Butyl benzyl phthalate.
 - (f) Cadmium.
 - (g) Di (2-ethylhexyl) phthalate.
 - (h) Di-n-butyl phthalate.
 - (i) Di-n-octyl phthalate.
 - (j) 1,2-dichlorobenzene.
 - (k) Diethyl phthalate.
 - (l) Dimethyl phthalate.
 - (m) Ethylbenzene.
 - (n) Ethylene Glycol.
 - (o) Formaldehyde.
 - (p) Hexavalent chromium.
 - (q) Isophorone.
 - (r) Lead.
 - (s) Mercury.
 - (t) Methyl ethyl ketone.
 - (u) Methyl isobutyl ketone.
 - (v) Methylene chloride.
 - (w) Naphthalene.
 - (x) Toluene (methylbenzene).
 - (y) 1,1,1-trichloroethane.
 - (z) Vinyl chloride.

2.3 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Wallboard : 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry : 12 percent.
 - 3. Interior Located Wood : 15 percent.
 - 4. Exterior Located Wood : 15 percent.
- D. Beginning of installation means acceptance of existing surfaces.

3.2 SURFACE PREPARATION - GENERAL

- A. Correct minor defects and clean surfaces which affect work of this Section.
- B. Shellac and seal marks which may bleed through surface finishes.
- C. Uncoated Steel and Iron: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint after repairs.
- D. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime paint steel surfaces.
- E. Existing surfaces to be recoated shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

3.3 SURFACE PREPARATION - MODERNIZATION

- A. Properly prepare all existing surfaces to receive new paint.
- B. Prior to application of any new paint, existing surfaces to be cleaned free of damaged paint, dust, corrosion, and other foreign matter which will destroy bond or mar appearance of new paint.
- C. Sand, scrape, fill and repair surfaces flush with suitable fillers. Patch and repair; feather edges to provide smooth transitions; match existing surfaces.
- D. Remove hardware and accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not-to-be-finish painted, or provide surface-applied protection. Reinstall removed items upon completion of work in each area.
- E. Existing surfaces to be painted shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be shall be spot primed with same primer as for new work.
- F. Existing paint removal:
 - 1. Remove loose, blistered, scaled, oxidized, cracked, alligatored, or defaced paint down to a sound surface.
 - 2. Brush and clean free all loose material.

3. Feather edges of removal areas to provide a smooth transition between surfaces.
- G. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.
- H. Washing and Cleaning:
 1. Remove all loose and foreign materials.
 2. At building interiors, wash all surfaces clean with approved cleaner and rinse with clean water.
 3. At building interiors, vacuum existing ceiling panels to remove all dirt and dust from the material surface. Utilize caution so as not to mar or damage the finish surface in any way.
 4. Completely remove wax from surfaces which receive new paint.
- I. Remove dust, grit, and foreign matter from existing wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks, and other defects after priming and spot prime repairs when fully cured.
- J. Ferrous metal shall be cleaned of oil, grease, and foreign matter. Cleaning method: SSPC-SP No. 1 "Solvent Cleaning".
- K. Ferrous Steel: Where raw metal surface is exposed, proceeds follows:
 1. Cleaning method: SSPC-SP No. 2 "Hand Cleaning" or No. 3 "Power Brush Cleaning" as required to remove corrosion, loose paint, and rust.
 2. Priming: Prime immediately after cleaning.
- L. Pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.

3.4 PROTECTION OF ADJACENT WORK

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.5 WORK NOT TO BE PAINTED

- A. Painting is not required on surfaces in concealed and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces and duct shafts.
- B. Do not paint metal surfaces such as stainless steel, chromium plate, brass, bronze, and similar finished metal surfaces.
- C. Do not paint anodized aluminum or other surfaces which are specified to be factory pre-finished.
- D. Do not paint sandblasted or architecturally finished concrete surfaces.

3.6 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.

- C. Apply prime coat to surfaces which are to be painted or finished.
- D. Apply each coat to uniform finish.
- E. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- F. Sand lightly between coats to achieve required finish.
- G. Allow applied coat to dry before next coat is applied.
- H. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
- I. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. Prime back surfaces of interior and exterior woodwork with primer paint.
- K. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- L. Paint mill finished door seals to match door or frame.
- M. Paint primed steel glazing stops in doors to match door or frame.
- N. Cloudiness, spotting, lap marks, brush marks, runs, sags, spikes and other surface imperfections will not be acceptable.
- O. Where spray application is used, apply each coat of the required thickness. Do not double back to build up film thickness of two coats in one pass.
- P. Where roller application is used, roll and redistribute paint to an even and fine texture. Leave no evidence of roller laps, irregularity of texture, skid marks, or other surface imperfections.

3.7 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.8 PROTECTION OF COMPLETED WORK

- A. Protect finished installation under provisions of Section 01 61 00.
- B. Erect barriers and post warning signs. Maintain in place until coatings are fully dry.
- C. Confirm that no dust generating activities will occur following application of coatings.

3.9 PATCHING

- A. After completion of painting in any one room or area, repair surfaces damaged by other trades.
- B. Touch-up or re-finish as required to produce intended appearance.

3.10 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 29.
- B. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary.
- C. The Owner will engage the services of an independent testing agency to sample paint material being used.
- D. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
- E. The testing agency will perform appropriate quantitative materials analysis and other characteristic testing of materials as required by the Owner.
- F. If test results show materials being used and their installation do not comply with specified requirements or manufacturer's recommendations, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing and repaint surfaces to acceptable condition.

3.11 COLOR SCHEDULE

- A. Paint and finish colors shall be selected by the Architect from manufacturer's entire range of standard and custom color selections and special colors selected to match or compliment the colors of other materials, equipment, or components which comprise the work.
- B. Access doors, registers, exposed piping, electrical conduit and mechanical/electrical panels: Generally the same color as adjacent walls.
- C. Exterior and interior steel doors, frames and trim: Generally a contrasting color to adjacent walls.
- D. Doors generally are all the same color, but of a contrasting color from frame and trim.
- E. Exterior and interior steel fabrications: Generally a contrasting color to adjacent walls.
- F. Exposed interior mechanical/ductwork: Generally a contrasting color to adjacent walls or ceiling.
- G. Ceilings are generally to be painted a different color than walls.
- H. Approximately 20 percent of overall painting work will be required to be "Deep Tone" colors. This work will require one additional coat of paint beyond that as specified.

3.12 SCHEDULE - EXTERIOR SURFACES

- A. Steel - Primed or Unprimed (Eggshell Urethane Alkyd Enamel)
 - 1st coat: BRPR00 Bloc-Rust Premium
 - 2nd coat: ASHL30 Aristoshield
 - 3rd coat: ASHL30 Aristoshield

END OF SECTION

SECTION 11 95 11

HIGH TEMPERATURE LINING SYSTEMS

1. PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The installation of the specified high temperature lining systems shall include all associated work required for proper installation including, but not limited to attachments to walls and ceilings, metal support framing infrastructure and coordination with disciplines of adjacent Work within Structure, Refer to plans.
- B. Work in This Section includes the following :
 - 1. Installation of High Temperature Lining Panels on Walls.
 - 2. Installation of High Temperature Lining Panels of Ceilings.
 - 3. Installation of Cold Formed metal framing and furring for the support of High Temperature lining panels.
 - 4. High Temperature Lining Battens.
 - 5. Full-Height protective wall angles for all outside corners of lining material.
 - 6. Installation of High Temperature Lining Panels on doors and frames indicated in the Drawings.
- C. Work to include full field verification of conditions and coordination of installation with adjacent construction trades specified elsewhere and depicted within the project drawings.

1.3 RELATED SECTIONS

- A. Section 03 30 00 -Cast in Place Concrete
- B. Section 04 20 00 -Concrete Masonry Units

1.4 WARRANTY

- A. High temperature lining systems shall have a full manufacturer warranty against defects or failures for a period of not less than ten (10) years from the date of project acceptance.

1.5 SUBMITTALS

- A. Product Data: Material product and performance data and installation instructions.
- B. Shop Drawings: Provide complete drawings showing; locations, fabrication , and installation of all joints including plans, elevations , sections, details of components , and attachments to other units of Work.
- C. Samples: Provide samples of material, framing accessories and wall angel protection: Full-size sample in for each trim accessory indicated.

D. Warranty and Maintenance manuals

1.6 QUALITY ASSURANCE

- A. Employ only installers familiar with the application and installation of high temperature lining materials for fire training buildings.
- B. Installers must display a minimum of five (5) years of experience in the provision and installation of high temperature lining systems.
- C. Provide full product data and certification certifying product for the application and performance specified herein.

1.7 REFERENCE

- A. NFPA 1403: Standard on Live Fire Training Evolutions
- B. NFPA 1500: Standard on Fire Department Occupational Health & Safety

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack panels flat.

1.9 PRODUCT MAINTENANCE

- A. Provide written instructions for the proper required maintenance and replacement of high temperature panels.

1.10 ADDITIONAL PRODUCT

- A. Upon completion of installation, contractor shall provide to the owner in manufacturer packaging a minimum of the following additional materials.
 - 1. Ten (10) full size high-temperature lining panels (24" x 48").
 - 2. Ten (10) high temperature battens. (3-3/4" x 48").

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cold Formed Galvanized Framing and Furring:
 - (a) Cemco Systems
 - (b) Dietrich Industries, Inc.
 - (c) Western Metal Lath & Steel Framing Systems
 - (d) Approved Equivalent

2. Padgenite Super HD® High Temperature Lining Material

- (a) WHP Trainingtowers: 519 Duck Road, Grandview, MO 64030. TEL: (800) 351-2525 or (913) 385-3663. FAX: (800) 736-7594. Email: info@trainingtowers.com, Website: www.trainingtowers.com
- (b) Fireblast Thermal Liner
- (c) Approved Equivalent

2.2 METAL FRAMING AND FURRING

- A. Carrying Channels: Cold-rolled, commercial-steel sheet with a base metal thickness of 18- gauge, a minimum 1/2-inch-wide flange, with manufacturer's standard corrosion-resistant zinc coating.
- B. Furring Channels: Commercial-steel sheet with ASTM A 653/A 653M, G40, manufacturer's standard corrosion-resistant zinc coating.
- C. 18-gauge Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep. Minimum Base Metal Thickness: 0.0179 inch.
- D. Resilient Furring Channels: 3/4 inch deep members designed to reduce sound transmission. Configuration: Asymmetrical , with face attached to single flange by a slotted leg.
- E. Fasteners: Battens attached with #6 x 1-7/8" Tek fasteners. Panels attached with #8 x 3" Tek fasteners with 1/4 x 1-1/4" flat washers .

2.3 HIGH TEMPERATURE PANELS & BATTENS

A. Proprietary Thermal Wall & Ceiling Liner Panels: Comply with the following:

- 1. Basis of Design Product: WHP Padgenite Super HD®.
- 2. Core: 1 inch thick, consisting of calcium silicate, reinforcing filler and natural organic fiber.
- 3. Panel Size: 24" x 48".
- 4. PCF Density: 77.9 PCF.
- 5. Flex Strength: 3,558 psi.
- 6. Continuous Service Temperature: 2,000° F.
- 7. K-factor: 1.92 at a mean temperature of 800° F.
- 8. Waterproofing : Two-part process on all sides.
- 9. Location: Refer to locations noted within the Drawings.

B. Proprietary Thermal Battens Liner Panels: Comply with the following:

- 1. Basis of Design Product: WHP Padgenite I.
- 2. Core: 1 inch thick, consisting of calcium silicate, reinforcing filler and natural organic fiber.
- 3. Batten Size: 3-3/4" x 48"
- 4. PCF Density: 46 PCF.
- 5. Flex Strength: 800 psi.
- 6. Continuous Service Temperature: 1,200° F.

7. K-factor: .81 at a mean temperature of 800° F.
8. Waterproofing: Two-part process on all sides

2.4 PROTECTIVE TRIM ACCESSORIES

A. Interior Galvanized Metal Trim: ASTM C 1047.

1. Material: Aluminum, Galvanized or aluminum-coated steel.
2. Shapes as follows:
 - (a) 2" x 2" Full-Height Corner Protection: Use at all outside corners within burn room areas and adjacent spaces.
 - (b) 18-gauge trim channels at all doors and windows in burn areas.

2.5 AUXILIARY MATERIALS

- A. General: Provide all auxiliary materials for installation and attachment of thermal panels in accordance with the published guidelines for "Installation of Padgenite® Panels and Accessories " provided by WHP Training Towers as the basis for installation.
- B. Galvanized Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use #8 x .Y." HWH T-2 Tek screws complying with ASTM C 954 for fastening panels to steel members.
 2. Use 2-1/4" "Tapcon" concrete anchors for attachment CMU walls.
 3. Use 5/8" S-12 screws for attaching angles.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Conduct meeting at site to examine all areas and substrates to receive the high temperature lining, with Installer and fire training prop supplier present, to verify completeness of work and coordination of installation process requirements with all disciplines.
- B. Coordinate requirements of adjacent trades and disciplines.
- C. Notify Architect of any discrepancies that would affect the proper installation of the high temperature lining material. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Proceed with installation of high temperature lining materials only upon verification that all Work of other trades adjacent to area has been completed and will not require removal and re-installation of panels.

3.2 SCHEDULE OF HIGH TEMPERATURE LINING LOCATIONS:

- A. Refer to drawings for locations of high temperature lining within Burn Room.

3.3 INSTALLATION OF HIGH TEMPERATURE WALL LINING

- A. Install wall grid system using metal furring and framing system in strict accordance with the guidelines provided by the product manufacturer.

- B. Install high temperature wall battens to framing in accordance with guidelines provided by the product manufacturer. Direct attachment of panels and battens to the structure is not permitted.
- C. Install high temperature wall panels to battens in accordance with specifications and guidelines provided by the product manufacturer.
- D. Install trims and accessories including protective wall edges and trims.

3.4 INSTALLATION OF HIGH TEMPERATURE CEILING LINING

- A. Install ceiling grid system using metal furring and framing system in strict accordance with the guidelines provided by the product manufacturer.
- B. Install high temperature ceiling battens to framing in accordance with guidelines provided by the product manufacturer. Direct attachment of panels and battens to the concrete structure is not permitted.
- C. Install high temperature ceiling panels to battens in strict accordance with specifications and guidelines provided by the product manufacturer.

3.5 INSTALLATION OF HIGH TEMPERATURE DOOR PROTECTION

- A. For Doors: Affix single layer of Padgenite material to interior face of door and frame unit. Interior lining system to wrap and protect door frame. Notch material at hardware and at hinge side to allow proper operation.

3.6 CLEANING AND PROTECTION

- A. Upon completion of Work, properly dispose of all trash, debris and materials.
- B. Clean all high temperature panels free from markings, dirt and smudges. Use only manufacturer-approved cleaning agents on panel surfaces.
- C. Protect all panels in place for the duration of construction. Remove prior to testing and startup of fire training simulators .

END OF SECTION



November 1, 2021

PBK-WLC Architects

8163 Rochester Avenue
Rancho Cucamonga, CA 91730

Attention: Jaime Moreno
Subject: San Marcos Training Tower Burn Room
Re: Addition of Padgenite Panels to Burn Room
Structural Fasteners Commentary

Dear Mr. Moreno,

Per the request of PBK-WLC, our firm was requested to review a proposed anchorage of the new Padgenite Fire Resistive Panel to the existing refractory concrete in the burn room of the San Marcos Training Tower.

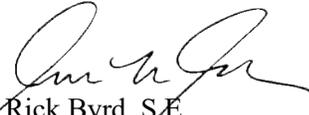
The existing refractory concrete is reinforced, has a thickness of 8", and is anchored to the existing masonry walls on vertical elevation, and the existing concrete slab above, in the vertical application. A specification of the existing refractory concrete was requested, but unavailable. The architect did provide a sample specification for refractory concrete, indicating a compressive strength of 7500 psi at 28 days. Based on this, the anchorage design will conservatively assume that the refractory concrete has a minimum compressive strength of 3000 psi in current installed condition.

The manufacturer has provided the product dead load for the demand calculation on the anchorage. The total loading of the panel system is 10 psf, with anchors spaced at 4 feet on center each way, for a maximum load of 160 lbs/anchor in tension at ceilings, and 160 lbs/ anchor in shear at wall applications. The requested anchor is a 3/8" diameter ITW Redhead Large Diameter Tapcon (LDT), galvanized, with a length of three inches. Per the ICC report (enclosed), the anchor is sufficient for the provided loading.

Installation of the 3/8 anchor shall comply with ICC ESR 3699, with special periodic inspection in compliance with section 4.4 of the ICC report. Installation torque shall be a maximum of 50 FT-LBS for manual installation as noted on page 8 of 16 of the ICC report. Impact torque wrench if used shall follow the ICC report. Minimum effective installation embedment (hef) shall be 2". Please note section 5.15 of the ICC report as it pertains to Fire Resistive construction. Manufacturer shall verify that the second exception regarding approved fire resisting materials satisfies the limitation.

Should you have any questions or require additional information please do not hesitate to contact our office.

Sincerely,


Rick Byrd, S.E.
President



DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

ADDITIONAL LISTEE:

ITW BRANDS

EVALUATION SUBJECT:

**TAPCON+ SCREW ANCHORS AND SAMMYS
 THREADED ROD ANCHORS FOR USE IN CRACKED
 AND UNCRACKED CONCRETE**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009, and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009, and 2006 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-3699 LABC and LARC Supplement](#).

Property evaluated:

Structural

2.0 USES

The 1/4-inch-, 3/8-inch-, and 1/2-inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors with Advanced Threadform Technology are used as anchorage in cracked and uncracked normalweight and lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static, wind, and seismic tension and shear loads.

The 1/2-inch-diameter (12.7 mm) Tapcon+ Screw Anchors with Advanced Threadform Technology are also used as anchorage when installed in the soffit of cracked and uncracked normalweight and sand-lightweight concrete over steel deck having a minimum specified compressive strength $f_c = 3,000$ psi (20.7 MPa) to resist static, wind, and seismic tension and shear loads.

The 1/4-inch-diameter (6.4 mm) SAMMYS Anchors for use with threaded rods are available in two head styles: the SAMMYS vertical threaded rod anchor, CCST 516; and SAMMYS horizontal threaded rod anchor, SW-CCST 516. The CCST 516 anchor is used as anchorage in cracked and uncracked normalweight and sand-lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static and wind, tension or shear loads, and seismic tension loads only. The SW-CCST 516 anchor is used as anchorage in uncracked normalweight and sand-lightweight concrete having a specified compressive strength $f_c = 2,500$ psi to 8,500 psi (17.2 MPa to 58.6 MPa) to resist static and wind shear loads only.

The anchoring system is an alternative to cast-in-place anchors described in Section 1901.3 of the 2015 IBC, Sections 1908 and 1909 of the 2012 IBC, and Sections 1911 and 1912 of the 2009 and 2006 IBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 Tapcon+ Anchors with Advanced Threadform Technology:

The Tapcon+ Anchors with Advanced Threadform Technology are manufactured from carbon steel with supplementary heat treatment. The anchors have an alternating high-low thread form on the shank and are available a variety of lengths with nominal diameters of 1/4-inch, 3/8-inch, and 1/2-inch (6.4 mm, 9.5 mm, and 12.7 mm). The Tapcon+ Screw Anchors are available with a hex washer head, and have a blue Climaseal® coating. Illustrations of anchors are provided in Figure 1.

3.2 SAMMYS Anchors for Threaded Rods:

The SAMMYS Screw Anchor is a two-piece, carbon steel threaded anchor that is comprised of the 1/4-inch-diameter (6.4 mm) Tapcon+ Screw Anchor with Advanced Threadform Technology and a 3/8-inch-16 UNC internal thread hex shaped cap. The hex shaped cap is manufactured from carbon steel alloy complying with UNS G1010 heat treated steel and has an electrodeposited coating of zinc, minimum thickness of 0.0002 inch (5 μm), in accordance with ASTM B633, SC1, Type III.

The SAMMYS Screw Anchors are available with a 2 1/2-inch (63.5 mm) length. Two models are available: SAMMYS Vertical Threaded Rod Anchor (Model No. CCST 516) and SAMMYS Horizontal Threaded Rod Anchor (Model No. SW-CCST 516). Figure 3 illustrates the SAMMYS vertical threaded rod anchor and SAMMYS

horizontal threaded rod anchor with their torque limiting installation tools. The installation tools are designed to prevent over torque conditions upon installation. The design also permits the nut driver to release from the head of the anchor once fully installed.

3.3 Concrete:

Normalweight and lightweight concrete must comply with Sections 1903 and 1905 of the IBC, as applicable.

3.4 Steel Deck Panels:

Steel deck panels must comply with the configurations in Figure 6 and have a minimum base steel thickness of 0.034 inch (0.864 mm). Steel must comply with ASTM A653 Grade 40, with a minimum yield strength of 40,000 psi (276 MPa).

4.0 DESIGN AND INSTALLATION

4.1 Strength Design:

4.1.1 General: Design strength of anchors complying with the 2015 IBC, as well as Section R301.1.3 of the 2015 IRC must be determined in accordance with ACI 318-14 Chapter 17 and this report.

Design strength of anchors complying with the 2012 IBC and Section R301.1.3 of the 2012 IRC, must be determined in accordance with ACI 318-11 Appendix D and this report.

Design strength of anchors complying with the 2009 IBC and Section R301.1.3 of the 2009 IRC must be determined in accordance with ACI 318-08 Appendix D and this report.

Design strength of anchors complying with the 2006 IBC and Section R301.1.3 of the 2006 IRC must be determined in accordance with ACI 318-05 Appendix D and this report.

Design parameters are provided in Tables 1, 2, 3 and 5 and references to ACI 318 are based on the 2015 IBC (ACI 318-14) and 2012 IBC (ACI 318-11) unless noted otherwise in Sections 4.1.2 through 4.1.12 of this report. The strength design must comply with ACI 318-14 17.3.1 or ACI 318-11 D.4.1, except as required in ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable.

Strength reduction factors, ϕ , as given in ACI 318-14 17.3.3 or ACI 318-11 Section D.4.3, as applicable, and noted in Tables 2, 3, and 5 must be used for load combinations calculated in accordance with Section 1605.2 of the IBC, Section 5.3 of ACI 318-14 or Section 9.2 of ACI 318-11, as applicable. Strength reduction factors as given in ACI 318-11 D.4.4 must be used for load combinations set forth in ACI 318-11 Appendix C.

The value of f_c used in the calculations must be limited to a maximum of 8,000 psi (55.2 MPa), in accordance with ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable.

4.1.2 Requirements for Static Steel Strength in Tension, N_{sa} : The nominal static steel strength of a single anchor in tension is calculated in accordance with ACI 318-14 17.4.1.2 or ACI 318 D.5.1.2, as applicable. The N_{sa} values of a single anchor are given in Table 2 of this report. Strength reduction factors, ϕ , corresponding to brittle steel elements as defined in ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, and provided in Table 2, must be used.

4.1.3 Requirements for Static Concrete Breakout Strength in Tension, N_{cb} or N_{cbg} : The nominal static concrete breakout strength for a single anchor or group of anchors in tension, N_{cb} or N_{cbg} , must be calculated in

accordance with ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, with modifications as described in this section. The basic concrete breakout strength in tension, N_b , must be calculated in accordance with ACI 318-14 17.4.2.2 or ACI 318-11 D.5.2.2, as applicable, using the values of h_{ef} and k_{cr} as given in Table 2. The nominal concrete breakout strength in tension in regions of concrete where analysis indicates no cracking at service loads in accordance with ACI 318-14 17.4.2.6 or ACI 318-11 D.5.2.6, as applicable, must be calculated using the values of k_{uncr} as given in Table 2 of this report with $\psi_{c,N} = 1.0$.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete breakout strength is not required.

4.1.4 Requirements for Static Pullout Strength in Tension, N_p : The nominal pullout strength of a single anchor in tension in accordance with ACI 318-14 17.4.3.1 and 17.4.3.2 or ACI 318-11 D.5.3.1 and D.5.3.2, as applicable, in cracked and uncracked concrete, $N_{p,cr}$ and $N_{p,uncr}$, respectively, is given in Table 2 of this report. For all design cases $\Psi_{c,p} = 1.0$. In accordance with ACI 318-14 17.4.3 or ACI 318-11 D.5.3, as applicable, the nominal pullout strength in cracked concrete may be adjusted for concrete strengths according to Eq-1:

$$N_{p,f'_c} = N_{p,cr} \left(\frac{f'_c}{2,500} \right)^n \quad (\text{lb,psi}) \quad (\text{Eq-1})$$

$$N_{p,f'_c} = N_{p,cr} \left(\frac{f'_c}{17.2} \right)^n \quad (\text{N,MPa})$$

where f'_c is the specified compressive strength and n is the factor defining the influence of concrete strength on the pullout strength. For the $3/8$ -inch-diameter anchor in cracked concrete, n is 0.12. For all other diameters, n is 0.5.

In regions where analysis indicates no cracking in accordance with ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, the nominal pullout strength in tension may be adjusted for concrete strengths according to Eq-2:

$$N_{p,f'_c} = N_{p,uncr} \left(\frac{f'_c}{2,500} \right)^n \quad (\text{lb,psi}) \quad (\text{Eq-2})$$

$$N_{p,f'_c} = N_{p,uncr} \left(\frac{f'_c}{17.2} \right)^n \quad (\text{N,MPa})$$

where f'_c is the specified compressive strength and n is the factor defining the influence of concrete strength on the pullout strength. For all diameters, n is 0.5.

Where values for $N_{p,cr}$ or $N_{p,uncr}$ are not provided in Table 2, the pullout strength in tension need not be evaluated.

The nominal pullout strength in cracked concrete of the $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchor installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, is given in Table 5. In accordance with ACI 318-14 17.4.3.2 or ACI 318 D.5.3.2, as applicable, the nominal pullout strength in cracked concrete must be calculated in accordance with Eq-1, whereby the value of $N_{p,deck,cr}$ must be substituted for $N_{p,cr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator. In regions where analysis indicates no cracking in accordance with ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, the nominal strength in uncracked concrete must be calculated according to Eq-2, whereby the value of $N_{p,deck,uncr}$ must be

substituted for $N_{p,uncr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator.

4.1.5 Requirements for Static Steel Strength in Shear, V_{sa} : The nominal steel strength in shear, V_{sa} , of a single anchor in accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, is given in Table 3 of this report and must be used in lieu of the values derived by calculation from ACI 318-14 Eq. 17.5.1.2b or ACI 318-11, Eq. D-29, as applicable. Strength reduction factors, ϕ , corresponding to brittle steel elements as defined in ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, and provided in Table 3, must be used.

The nominal shear strength $V_{sa,deck}$, of anchors installed in the soffit of sand-lightweight or normalweight concrete filled steel deck floor and roof assemblies, as shown in Figure 6, is given in Table 5.

4.1.6 Requirements for Static Concrete Breakout Strength of Anchor in Shear, V_{cb} or V_{cbg} : The nominal static concrete breakout strength of a single anchor or group of anchors in shear, V_{cb} or V_{cbg} , must be calculated in accordance with ACI 318-14 17.5.2 or ACI 318-11 D.6.2, as applicable, with modifications as described in this section. The basic concrete breakout strength of a single anchor in shear, V_b , must be calculated in accordance with ACI 318-14 17.5.2.2 or ACI 318-11 D.6.2.2, as applicable, based on the values provided in Table 3. The value of l_e used in ACI 318-14 Eq. 17.5.2.2a or ACI 318-11 Eq. D-33, as applicable, must be taken as no greater than the lesser of h_{ef} or $8d_a$.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete breakout strength in shear is not required.

4.1.7 Requirements for Static Concrete Pryout Strength in Shear, V_{cp} or V_{cpg} : The nominal static concrete pryout strength of a single anchor or group of anchors in shear, V_{cp} or V_{cpg} , must be calculated in accordance with ACI 318-14 17.5.3 or ACI 318-11 D.6.3, as applicable, using the value of K_{cp} described in Table 3, and the values of N_{cb} or N_{cbg} as calculated in Section 4.1.3 of this report.

For $1/2$ inch (12.7 mm) diameter Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, as shown in Figure 6, calculation of the concrete pryout strength in shear is not required.

4.1.8 Requirements for Seismic Design:

4.1.8.1 General: For load combinations including seismic, the design must be performed according to ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Modifications to ACI 318-14 17.2.3 shall be applied under Section 1905.1.8 of the 2015 IBC. For the 2012 IBC, Section 1905.1.9 must be omitted. Modifications to ACI 318 (-08, -05) D.3.3 must be applied under Section 1908.1.9 of the 2009 IBC or Section 1908.1.16 of the 2006 IBC, as applicable.

The anchors comply with ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, as brittle steel elements and must be designed in accordance with ACI 318-14 17.2.3.4, 17.2.3.5, 17.2.3.6 or 17.2.3.7; ACI 318-11 D.3.3.4, D.3.3.5, D.3.3.6 or D.3.3.7; or ACI 318-08 D.3.3.4, D.3.3.5 or D.3.3.6; or ACI 318-05 D.3.3.4 or D.3.3.5, as applicable.

The $1/4$ -inch-, $3/8$ -inch-, and $1/2$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors may be installed in regions designated as IBC Seismic Design Categories A through F.

The $1/4$ -inch (6.4 mm) SAMMYS vertical threaded rod anchors (CCST 516) are limited to seismic tension loads only, and seismic shear loads are beyond the scope of this report. The $1/4$ -inch (6.4 mm) SAMMYS horizontal threaded rod anchors (SW-CCST 516) are limited to static shear loads only, and seismic tension or shear loads are beyond the scope of this report. The SAMMYS vertical threaded rod anchors (CCST 516) may be installed in regions designated as IBC Seismic Design Categories A through F.

4.1.8.2 Seismic Tension: The nominal steel strength and nominal concrete breakout strength for anchors in tension must be calculated according to ACI 318-14 17.4.1 and 17.4.2 or ACI 318-11 D.5.1 and D.5.2, respectively, as applicable, as described in Sections 4.1.2 and 4.1.3 of this report. In accordance with ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the value for nominal pullout strength in tension for seismic loads, $N_{p,eq}$ or $N_{p,deck,cr}$, given in Table 2 and Table 5 of this report, must be used in lieu of N_p . The values of $N_{p,eq}$ or $N_{p,deck,cr}$ must be adjusted for the concrete strength in accordance with Eq-2 and Section 4.1.4 whereby the value of $N_{p,deck,cr}$ must be substituted for $N_{p,cr}$ and the value of 3,000 psi (20.7 MPa) must be substituted for the value of 2,500 psi (17.2 MPa) in the denominator. If no values for $N_{p,eq}$ are given in Table 2 or Table 5, the static design strength values govern.

4.1.8.3 Seismic Shear: The nominal concrete breakout strength and pryout strength for anchors in shear must be calculated according to ACI 318-14 17.5.2 and 17.5.3 or ACI 318-11 D.6.2 and D.6.3, respectively, as applicable, as described in Sections 4.1.6 and 4.1.7 of this report. In accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, the value for nominal steel strength in shear for seismic loads, $V_{sa,eq}$, or $V_{sa,deck}$, given in Tables 3 or 5 of this report, must be used in lieu of V_{sa} , as applicable.

4.1.9 Requirements for Interaction of Tensile and Shear Forces: For designs that include combined tension and shear, the interaction of tension and shear loads must be calculated in accordance with ACI 318-14 17.6 or ACI 318-11 D.7, as applicable. For the Sammys anchors, influence of bending on tension values when loaded in shear must be considered.

4.1.10 Requirements for Critical Edge Distance: In applications where $c < c_{ac}$ and supplemental reinforcement to control splitting of the concrete is not present, the concrete breakout strength in tension for uncracked concrete, calculated in accordance with ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, must be further multiplied by the factor $\psi_{cp,N}$ given by Eq-3:

$$\psi_{cp,N} = \frac{c}{c_{ac}} \quad (\text{Eq-3})$$

whereby the factor $\psi_{cp,N}$ need not be taken as less than $\frac{1.5h_{ef}}{c_{ac}}$. For all other cases, $\psi_{cp,N} = 1.0$. In lieu of ACI 318-14 17.7.6 or ACI 318-11 D.8.6, as applicable, the values for the critical edge distance, c_{ac} , must be taken from Table 1.

4.1.11 Requirements for Minimum Member Thickness, Minimum Anchor Spacing and Minimum Edge Distance: In lieu of ACI 318-14 17.7.1 and 17.7.3 or ACI 318-11 D.8.1 and D.8.3, respectively, as applicable, values of s_{min} and c_{min} as given in Table 1 of this report must be used. In lieu of ACI 318-14 17.7.5 or ACI 318-11 D.8.5, minimum concrete thickness h_{min} as given in Table 1 of this report must be used.

For $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchors installed in the soffit of sand-lightweight or normalweight concrete on steel deck floor and roof assemblies, the anchors must be installed in accordance with Figure 6 and must have an axial spacing along the flute equal to the greater of $3h_{ef}$ or 1.5 times the flute width.

4.1.12 Lightweight Concrete: For the use of anchors in lightweight concrete, the modification factor λ_a equal to 0.8λ is applied to all values of $\sqrt{f'_c}$ affecting N_n and V_n .

For ACI 318-14 (2015 IBC), ACI 318-11 (2012 IBC) and ACI 318-08 (2009 IBC), λ shall be determined in accordance with the corresponding version of ACI 318.

For ACI 318-05 (2006 IBC), λ shall be taken as 0.75 for all lightweight concrete and 0.85 for sand-lightweight concrete. Linear interpolation shall be permitted if partial sand replacement is used. In addition, the pullout strengths $N_{p,uncr}$, $N_{p,cr}$ and $N_{p,eq}$ shall be multiplied by the modification factor, λ_a , as applicable.

For anchors installed in the soffit of sand-lightweight concrete-filled steel deck and floor and roof assemblies, further reduction of the pullout values provided in this report is not required.

4.2 Allowable Stress Design:

4.2.1 General: Design values for use with allowable stress design (working stress design) load combinations calculated in accordance with Section 1605.3 of the IBC, must be established as follows:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \quad (\text{Eq-4})$$

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \quad (\text{Eq-5})$$

where:

$T_{allowable, ASD}$ = Allowable tension load (lbf or kN).

$V_{allowable, ASD}$ = Allowable tension load (lbf or kN).

ϕN_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05 Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report, as applicable (lbf or kN).

ϕV_n = Lowest design strength of an anchor or anchor group in shear as determined in accordance with ACI 318-14 Chapter 17 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, ACI 318-05

Appendix D and 2006 IBC Section 1908.1.16, and Section 4.1 of this report, as applicable (lbf or kN).

α = Conversion factor calculated as a weighted average of the load factors for the controlling load combination. In addition, α must include all applicable factors to account for nonductile failure modes and required over-strength.

Limits on edge distance, anchor spacing and member thickness as given in Section 4.1.11 of this report must apply. An illustrative example of allowable stress design values is shown in Table 4.

4.2.2 Interaction of Tensile and Shear Forces: The interaction must be calculated and consistent with ACI 318-14 17.6 or ACI 318 (-11, -08, -05) D.7, as applicable, as follows:

If $T_{applied} \leq 0.2 T_{allowable,ASD}$, the full allowable load in shear $V_{allowable,ASD}$ shall be permitted.

If $V_{applied} \leq 0.2 V_{allowable,ASD}$, the full allowable load in tension $T_{allowable,ASD}$ shall be permitted.

For all other cases:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \leq 1.2 \quad (\text{Eq-6})$$

4.3 Installation:

Installation parameters are provided in Table 1 and Figures 4 and 6 of this report. The Tapcon+ Screw Anchors and SAMMYS Anchors must be installed in accordance with the manufacturer's published instructions and this report. In case of conflict, this report governs. Anchor locations must comply with this report and the plans and specifications approved by the code official.

4.3.1 Tapcon+ Screw Anchors with Advanced Threadform Technology: $1/4$ -inch-, $3/8$ -inch-, and $1/2$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors must be installed according to ITW's published instructions and this report. For the $1/4$ -inch-diameter (6.4 mm) anchor, the holes must be predrilled in concrete with a carbide-tipped drill bit complying with ANSI B212.15-1994 or a Tapcon+ carbide-tipped drill bit, supplied by ITW. For the $3/8$ -inch- and $1/2$ -inch-diameter (9.5 mm and 12.7 mm) anchors, the holes must be predrilled in concrete with a carbide-tipped drill bit complying with ANSI B212.15-1994. The hole must be drilled to the specified minimum hole depth, h_{hole} , in accordance with Table 1. Before anchor installation, dust and other debris must be removed by use of a vacuum or compressed air. The anchors must then be installed through the attachment into the hole, in accordance with ITW's instructions, to the specified nominal embedment depth using a powered impact wrench or manual torque wrench until the proper embedment depth is obtained. The maximum impact wrench torque and maximum installation torque for the manual torque wrench must be in accordance with Table 1. The Tapcon+ Screw Anchors may be loosened by a maximum of one turn and retightened with a manual torque wrench or powered impact wrench to facilitate fixture attachment or realignment. Complete removal and reinstallation of the anchor is not allowed.

For installation of the $1/2$ -inch-diameter (12.7 mm) Tapcon+ Screw Anchor in the soffit of concrete on steel deck assemblies, the hole diameter in the steel deck must

not exceed the diameter of the hole in the concrete by more than $\frac{1}{8}$ inch (3.2 mm). For member thickness and edge distance restrictions for installations into the soffit of concrete on steel deck assemblies, see Figure 6.

4.3.2 SAMMYS Anchors for Threaded Rod: The SAMMYS Anchors must be installed according to ITW's published instructions and this report. Holes must be predrilled in concrete with a Tapcon carbide-tipped drill bit complying with ANSI B212.15-1994, supplied by ITW. The hole must be drilled to the specified nominal embedment depth plus a minimum of $\frac{1}{4}$ inch (6.4 mm). Before anchor installation, dust and other debris must be removed by use of a vacuum or compressed air. The anchors must then be installed into the hole, in accordance with ITW's instructions, to the specified nominal embedment depth using a powered impact wrench in conjunction with the ITW torque limiting nut driver until the proper embedment depth is obtained. Removal and reinstallation of the anchor is not allowed.

4.4 Special Inspection:

Periodic special inspection is required in accordance with Section 1705.1.1 and Table 1705.3 of the 2015 IBC and 2012 IBC; or Section 1704.15 and Table 1704.4 of the 2009 IBC; or Section 1704.13 of the 2006 IBC, as applicable. The special inspector must make periodic inspections during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, hole dimensions, anchor spacing, edge distances, concrete thickness, anchor embedment, drill bit type and size, hole cleaning procedures, installation torque, and adherence to the manufacturer's published installation instructions and the conditions of this report (in case of conflict, this report governs). The special inspector must be present as often as required in accordance with the "statement of special inspection."

5.0 CONDITIONS OF USE

The Tapcon+ Screw Anchors and SAMMYS Anchors described in this report are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Anchor sizes, dimensions, embedment, and installation are as set forth in this report.
- 5.2 The anchors must be installed in accordance with the manufacturer's published installation instructions and this report. In case of conflict, this report governs.
- 5.3 The $\frac{1}{4}$ -inch-, $\frac{3}{8}$ -inch-, and $\frac{1}{2}$ -inch-diameter (6.4 mm, 9.5 mm and 12.7 mm) anchors must be used in cracked and uncracked normalweight concrete and lightweight concrete having a specified compressive strength, f_c , of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).
- 5.4 The $\frac{1}{2}$ -inch-diameter (12.7 mm) anchor may be used in cracked and uncracked normalweight or sand-lightweight concrete over metal deck having a minimum specified compressive strength, f_c , of 3,000 psi (20.7 MPa).
- 5.5 The values of f_c used for calculation purposes must not exceed 8,000 psi (55.1 MPa).
- 5.6 The concrete shall have attained its minimum design strength prior to installation of the anchors.
- 5.7 Strength design values must be established in accordance with Section 4.1 of this report.
- 5.8 Allowable stress design values must be established in accordance with Section 4.2 of this report.
- 5.9 Anchor spacing, edge distance, and minimum concrete thickness must comply with Section 4.1.11, Table 1, and Figure 6 of this report.
- 5.10 Reported values for the SAMMYS Anchors for Threaded Rod do not consider the steel element threaded into the anchor, which must be verified by the design professional. SAMMYS Anchors must be installed directly into the concrete, without the use of a baseplate.
- 5.11 Prior to installation, calculations and details demonstrating compliance with this report must be submitted to the code official for approval. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.12 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under these conditions is beyond the scope of this report.
- 5.13 The $\frac{1}{4}$ -inch-, $\frac{3}{8}$ -inch-, and $\frac{1}{2}$ -inch-diameter (6.4 mm, 9.5 mm, and 12.7 mm) Tapcon+ Screw Anchors may be used to resist short-term loading due to wind forces and for seismic load combinations in locations designated as Seismic Design Categories A through F under the IBC, subject to the conditions of this report.
- 5.14 The $\frac{1}{4}$ -inch-diameter (6.4 mm) SAMMYS Anchors may be used to resist short-term loading due to wind forces and seismic tension loads only in locations designated as Seismic Design Categories A through F under the IBC, subject to the conditions of this report.
- 5.15 Anchors are not permitted to support fire-resistance-rated construction. Where not otherwise prohibited by the code, anchors are permitted for installation in fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:
 - Anchors are used to resist wind or seismic forces only.
 - Anchors that support a fire-resistance-rated envelope or a fire-resistance-rated membrane, are protected by approved fire-resistance-rated materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
 - Anchors are used to support nonstructural elements.
- 5.16 The anchors have been evaluated for reliability against brittle failure and found to be not significantly sensitive to stress-induced hydrogen-embrittlement.
- 5.17 The design of anchor groups in accordance with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, is valid for screw anchors with a thread length of at least 80 percent of the nominal embedment depth. Anchors with a thread length less than 80 percent of the nominal embedment depth shall be designed as single anchors.

- 5.18 Use of anchors must be limited to dry, interior locations.
- 5.19 Special inspection must be provided in accordance with Section 4.4 of the report.
- 5.20 Anchors are manufactured in the U.S.A. under an approved quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193), dated October 2015; and quality-control documentation.

7.0 IDENTIFICATION

The Tapcon+ Screw Anchors and SAMMYS Anchors are identified by packaging labeled with the manufacturer’s name (ITW Red Head, ITW Buildex, or ITW Brands), contact information, anchor name, anchor size, and evaluation report number (ESR-3699). The Red Head logo or “BX” logo, and a length identification code letter are stamped on the head of each anchor. See the length identification system illustrated in Figure 2 of this report.

- 7.1 The report holder’s contact information is the following:

ITW RED HEAD
ITW BUILDEX
700 HIGH GROVE BOULEVARD
GLENDALE HEIGHTS, ILLINOIS 60139
(800) 848-5611
www.itw-redhead.com
techsupport@itwccna.com

- 7.2 The Additional Listee’s and manufacturing locations contact information is the following:

ITW BRANDS
955 NATIONAL PARKWAY, SUITE 95500
SCHAUMBURG, ILLINOIS 60173
(877) 489-2726
www.itwbrands.com

TABLE A—PRODUCT IDENTIFICATION CROSS REFERENCE BY MANUFACTURER

PRODUCT REFERENCE PER ICC-ES ESR-3699	ITW RED HEAD	ITW BUILDEX	ITW BRANDS
1/4" SAMMYS for Vertical Rod	Not applicable	1/4" SAMMYS for Vertical Rod Part No. CCST 516	Not applicable
1/4" SAMMYS for Horizontal Rod	Not applicable	1/4" SAMMYS for Horizontal Rod Part No. SW-CCST 516	Not applicable
1/4" Tapcon+ Anchor	1/4" Tapcon+ Anchor	Not applicable	Buildex 5/16" Tapcon+ Anchor
3/8" Tapcon+ Anchor	3/8" Tapcon+ Anchor	Not applicable	Buildex 3/8" Tapcon+ Anchor
1/2" Tapcon+ Anchor	1/2" Tapcon+ Anchor	Not applicable	Buildex 1/2" Tapcon+ Anchor



FIGURE 1—TAPCON+ SCREW ANCHOR WITH ADVANCED THREADFORM TECHNOLOGY

LENGTH MARKING ON ANCHOR HEAD			A	B	C	D	E	F	G	H	I	J
Length of anchor (inches)	From	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Up to, but not including	1½	2	2½	3	3½	4	4½	5	5½	6	6½

For SI: 1 inch = 25.4 mm.

FIGURE 2—LENGTH IDENTIFICATION SYSTEM



SAMMYS Vertical Threaded Rod Anchor (Model No. CCST 516) with torque-limiting nut driver (#14 Black Nut Driver)

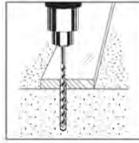
SAMMYS Horizontal Threaded Rod Anchor (Model No. SW-CCST 516) with torque-limiting nut driver (#14 SW Red Nut Driver)

FIGURE 3—SAMMYS SCREW ANCHORS FOR THREADED ROD

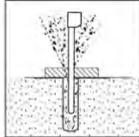


INSTALLATION INSTRUCTIONS FOR TAPCON+ SCREW ANCHORS

Installation Steps for Concrete, Lightweight Concrete and Metal Deck



1. Using a carbide drill bit, drill a hole at least 1/4" deeper than anchor embedment.



2. Clean hole with pressurized air or vacuum to remove any excess dust/debris.



3. Using an impact or manual wrench, insert anchor into hole and tighten anchor until fully seated.

ANCHOR DIAMETER (inch)	ANSI DRILL BIT DIAMETER (inch) ¹	ANCHOR HEAD (SOCKET SIZE) DIAMETER (inch)	ANCHOR HEAD HEIGHT (inch)	WASHER DIAMETER (inch)	MANUAL WRENCH MAX TORQUE ²	IMPACT WRENCH MAX TORQUE RATING
1/4 (ITW Red Head Anchor)	1/4	3/8	0.24	1/2	20 FT LBS	115 FT LBS
5/16 (ITW Brands Anchor)	1/4	3/8	0.24	1/2	20 FT LBS	115 FT LBS
3/8	3/8	9/16	0.35	13/16	50 FT LBS	200 FT LBS
1/2	1/2	3/4	0.45	1	70 FT LBS	345 FT LBS

¹ A 1/4-inch Tapcon+ drill bit may also be used for installation of the 1/4-inch anchor.

² For manual installation, use a torque wrench to verify that the maximum installation torque has not been exceeded.



Installation Steps for Concrete

1. Using a 1/4-inch Tapcon+ drill bit, drill a hole at least 1/4-inch deeper than anchor embedment.
2. Clean hole with compressed air or vacuum to remove any excess dust/debris.
3. Insert appropriate torque-limiting nut driver into the drill. See chart below.
4. Insert the anchor into the nut driver, position the anchor into hole and tighten anchor until nut driver spins free on cap of anchor.

Anchor Model	Torque-Limiting Nut Driver (Color)	Installation Orientation	Rod Size (inch)
CCST 516	#14 (Black)	Vertical	3/8
SW-CCST 516	#14 SW (Red)	Horizontal	3/8

FIGURE 4—INSTALLATION INSTRUCTIONS FOR TAPCON+ SCREW ANCHOR AND SAMMYS THREADED ROD ANCHOR

TABLE 1—INSTALLATION INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS^{1,6}

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)						
			¹ / ₄		¹ / ₄	³ / ₈	¹ / ₂		
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head	Hex Head	Hex Head		
Nominal Outside diameter (Shank)	d_a (d_o) ³	in.	0.25		0.25	0.38	0.50		
Nominal Outside diameter (threads)	—	in.	0.33		0.33	0.46	0.59		
Drill bit specification	d_{bit}	in.	¹ / ₄ Tapcon+ Bit		¹ / ₄ Tapcon+ Bit	¹ / ₄ ANSI Bit	³ / ₈ ANSI Bit	¹ / ₂ ANSI Bit	
Minimum base plate clearance hole diameter	d_h	in.	Not applicable ²		³ / ₈	¹ / ₂	⁵ / ₈		
Maximum installation torque ⁵	$T_{inst, max}$	ft-lbf	Not applicable ⁴		20	50	70		
Maximum Impact Wrench Torque Rating	$T_{impact, max}$	ft-lbf	Not applicable ⁴		115	200	345		
Effective embedment depth	h_{ef}	in.	1.67		1.45	1.78	1.32	2.17	3.02
Minimum nominal embedment depth ⁶	h_{nom}	in.	2 ¹ / ₄		2	2 ¹ / ₂	2	3	4
Minimum hole depth	h_{hole}	in.	2 ¹ / ₂		2 ¹ / ₄	2 ³ / ₄	2 ¹ / ₄	3 ¹ / ₄	4 ¹ / ₄
Minimum concrete member thickness	h_{min}	in.	4		4	4	4	6	
Critical edge distance	c_{ac}	in.	2 ¹ / ₂		2 ¹ / ₂	4 ¹ / ₂	3	4	5
Minimum edge distance	c_{min}	in.	1 ¹ / ₂		1 ¹ / ₂	1 ¹ / ₂	2 ¹ / ₂	1 ³ / ₄	2 ¹ / ₂
Minimum spacing	s_{min}	in.	3		3	3	3	3 ¹ / ₂	3

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318 Appendix D, as applicable.

²The Sammys Anchor is installed without a base plate, directly into the concrete.

³For the 2006 IBC, d_o replaced d_a .

⁴Installation must be performed with an ITW torque limiting nut driver, as applicable. See Section 4.3 for additional information.

⁵ $T_{inst, max}$ applies to installations using a calibrated torque wrench.

⁶For the ³/₈-inch-, and ¹/₂-inch-diameter Tapcon+ anchors, the design of anchor groups in accordance with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, is only valid for screw anchors with a thread length of at least 80 percent of the nominal embedment depth. Anchors with a thread length less than 80 percent of the nominal embedment depth shall be designed as single anchors.

TABLE 2—TENSION STRENGTH DESIGN INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS¹

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)							
			¹ / ₄		¹ / ₄	³ / ₈	¹ / ₂			
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head		Hex Head	Hex Head		
Drill bit specification		in.	¹ / ₄ Tapcon+ Bit		¹ / ₄ Tapcon+ Bit	¹ / ₄ ANSI Bit	³ / ₈ ANSI Bit	¹ / ₂ ANSI Bit		
Anchor category	1, 2 or 3	—	1		1	2	1	1		
Effective embedment depth	h_{ef}	in.	1.45 ⁶		1.45		1.78	1.32	2.17	3.02
Minimum concrete member thickness	h_{min}	in.	4		4		4	4	6	
Critical edge distance	c_{ac}	in.	2 ¹ / ₂		2 ¹ / ₂		4 ¹ / ₂	3	4	5
Data for Steel Strength in Tension										
Minimum specified yield strength	f_y	psi	Not applicable		100,000		100,000	100,000		
Minimum specified ultimate strength	$f_{uta} (f_{ut})^5$	psi	Not applicable		125,000		125,000	125,000		
Effective tensile stress area	A_{se}	in ²	Not applicable		0.0470		0.098	0.1850		
Steel strength in tension	N_{sa}	lbf	1,822 ⁷		5,900		12,250	23,125		
Strength reduction factor ϕ for tension, steel failure modes ²	ϕ_{sa}	—	0.65		0.65		0.65	0.65		
Data for Concrete Breakout Strength in Tension										
Effectiveness factor - uncracked concrete	k_{uncr}	—	24		24		27	30		
Effectiveness factor - cracked concrete	k_{cr}	—	17		17		17	17		
Modification factor for cracked and uncracked concrete ³	$\psi_{c,N} (\psi_3)^5$	—	1.0		1.0		1.0	1.0		
Strength reduction factor ϕ for tension, concrete failure modes, Condition B ³	ϕ_{cb}	—	0.65		0.65	0.55	0.65	0.65		
Data for Pullout Strength in Tension										
Pullout strength, uncracked concrete	$N_{p,uncr}$	lbf	2,107		2,107		See Footnote 4	See Footnote 4		
Pullout strength, cracked concrete	$N_{p,cr}$	lbf	857		857		1,837	See Footnote 4		
Pullout strength for seismic loads	$N_{p,eq}$	lbf	857		857		1,677	See Footnote 4		
Strength reduction factor ϕ for tension, pullout failure modes, Condition B ³	ϕ_p	—	0.65		0.65	0.55	0.65	See Footnote 4		
Additional Anchor Data										
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lbf /in	385,000		385,000		800,000	800,000		
Axial stiffness in service load range in cracked concrete	β_{cr}	lbf /in	225,000		225,000		365,000	365,000		

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

²The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318 Section 9.2, as applicable, are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(b).

³The tabulated value of ϕ_{cb} and ϕ_{cp} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.

⁴Pullout resistance does not govern design and does not need to be considered.

⁵The notation in parentheses is for the 2006 IBC.

⁶For calculation only. For actual h_{ef} see Table 1.

⁷For the strength between the threaded cap and anchor head.

TABLE 3—SHEAR STRENGTH DESIGN INFORMATION FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS¹

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)							
			$\frac{1}{4}$		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$			
Head Style	—	—	SAMMYS for Vertical Rod (CCST 516)	SAMMYS for Horizontal Rod (SW-CCST 516)	Hex Head		Hex Head	Hex Head		
Drill bit specification		in.	$\frac{1}{4}$ Tapcon+ Bit		$\frac{1}{4}$ Tapcon+ Bit	$\frac{1}{4}$ ANSI Bit	$\frac{3}{8}$ ANSI Bit	$\frac{1}{2}$ ANSI Bit		
Anchor category	1, 2 or 3	—	1		1	2	1	1		
Minimum effective embedment depth	h_{ef}	in.	1.45 ⁶		1.45		1.78	1.32	2.17	3.02
Minimum concrete member thickness	h_{min}	in.	4		4		4	4	6	
Critical edge distance	c_{ac}	in.	2 $\frac{1}{2}$		2 $\frac{1}{2}$		4 $\frac{1}{2}$	3	4	5
Data for Steel Strengths in Shear										
Minimum specified yield strength	f_y	psi	Not applicable		100,000	100,000	100,000	100,000		
Minimum specified ultimate strength	$f_{uta} (f_{ut})^4$	psi	Not applicable		125,000	125,000	125,000	125,000		
Effective shear stress area	A_{se}	in ²	Not applicable		0.047	0.098	0.185	0.185		
Steel strength in shear - static	V_{sa}	lbf	905 ⁷		2,045	3,621	12,610	12,610		
Steel strength in shear - seismic	$V_{sa,eq}$		Not applicable ⁵		1,350	2,920	9,300	9,300		
Strength reduction factor ϕ for shear, steel failure modes ²	ϕ_{sa}	—	0.60		0.60	0.60	0.60	0.60		
Data for Concrete Breakout and Concrete Pryout Strengths in Shear										
Nominal Outside diameter (shank)	$d_a (d_o)^4$	in.	0.25		0.25	0.38	0.50	0.50		
Load bearing length of anchor	ℓ_e	—	1.67		1.45	1.78	1.32	2.17	3.02	3.02
Coefficient for Pryout Strength	κ_{cp}	—	1.0		1.0	1.0	1.0	1.0		2.0
Strength reduction factor for shear, concrete breakout ³	ϕ_{cb}	—	0.70		0.70	0.70	0.70	0.70		
Strength reduction factor for shear, pryout ³	ϕ_{cp}	—	0.70		0.70	0.70	0.70	0.70		

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹The data presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

²The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(b).

³The tabulated value of ϕ_{cb} and ϕ_{cp} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.

⁴The notation in parentheses is for the 2006 IBC.

⁵The SAMMYS anchors have not been evaluated for seismic shear design under this report.

⁶For calculation only. For actual h_{ef} see Table 1.

⁷For the strength between the threaded cap and anchor head.

TABLE 4—EXAMPLE ALLOWABLE STRESS DESIGN TENSION VALUES FOR ILLUSTRATIVE PURPOSES FOR TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS ^{1,2,3,4,5,6,7,8,9}

NOMINAL ANCHOR DIAMETER (inch)	NOMINAL EMBEDMENT DEPTH (inches)	EFFECTIVE EMBEDMENT DEPTH (inches)	ALLOWABLE TENSION LOAD (pounds)
1/4 SAMMYS	2.25	1.45 ¹⁰	800
1/4	2.00	1.45	920
3/8	2.50	1.78	1,335
1/2	2.00	1.32	800
	3.00	2.17	1,685
	4.00	3.02	2,765

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 0.006895 MPa.

¹Single anchor with static tension load only.

²Concrete determined to remain uncracked for the life of the anchorage.

³Load combination from ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, (no seismic loading).

⁴30 percent dead load and 70 percent live load, controlling load combination 1.2D + 1.6L.

⁵Calculation of weighted average for $\alpha = 0.3 * 1.2 + 0.7 * 1.6 = 1.48$.

⁶Normalweight concrete, $f'_c = 2,500$ psi

⁷ $C_{a1} = C_{a2} > C_{ac}$.

⁸ $h \geq h_{min}$.

⁹Condition B where supplementary reinforcement in accordance with ACI 318-14 Section 17.3.4 or ACI 318-11 Section D.4.4, as applicable, is not provided.

¹⁰For calculation only. For actual h_{ef} see Table 1.

Illustrative Procedure to Calculate Allowable Stress Design Tension Value:

Tapcon+ Screw Anchor 1/2-inch diameter, using an embedment of 4-inches, assuming the conditions given in Table 4.

	PROCEDURE	CALCULATION
Step 1	Calculate steel strength of a single anchor in tension per ACI 318-14 17.4.1.2, ACI 318-11 D 5.1.2, Table 2 of this report:	$\phi N_{sa} = \phi N_{sa}$ $= 0.70 * 23,125$ = 15,031 lbs steel strength
Step 2	Calculate concrete breakout strength of a single anchor in tension per ACI 318-14 17.4.2.2, ACI 318-11 D 5.2.2, Table 2 of this report:	$N_b = k_{uncr} \sqrt{f'_c} h_{ef}^{1.5}$ $= 24 * \sqrt{2,500} * 3.02^{1.5}$ $= 6,298$ lbs $\phi N_{cb} = \phi A_{NC} / A_{NCO} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b$ $= 0.65 * 1.0 * 1.0 * 1.0 * 1.0 * 6,298$ $= 0.65 * 6,298$ = 4,093 lbs concrete breakout strength
Step 3	Calculate pullout strength per Table 2 of this report:	$\phi N_{pn} = \phi N_{p,uncr} \psi_{c,P}$ n/a – pullout strength does not control (see Table 2, footnote 4)
Step 4	Determine controlling resistance strength in tension per ACI 318-14 17.3.1.1 and 17.3.1.2, ACI 318-11 D 4.1.1 and D 4.1.2:	= 4,093 lbs controlling resistance (concrete)
Step 5	Calculate allowable stress design conversion factor for loading condition per ACI 318-14 Section 5.3, or ACI 318-11 Section 9.2:	$\alpha = 1.2D + 1.6L$ $= 1.2(0.3) + 1.6(0.7)$ = 1.48
Step 6	Calculate allowable stress design value per Section 4.2 of this report:	$T_{allowable, ASD} = \phi N_n / \alpha$ $= 4,093 / 1.48$ = 2,765 lbs allowable stress design

FIGURE 5—EXAMPLE DESIGN CALCULATION

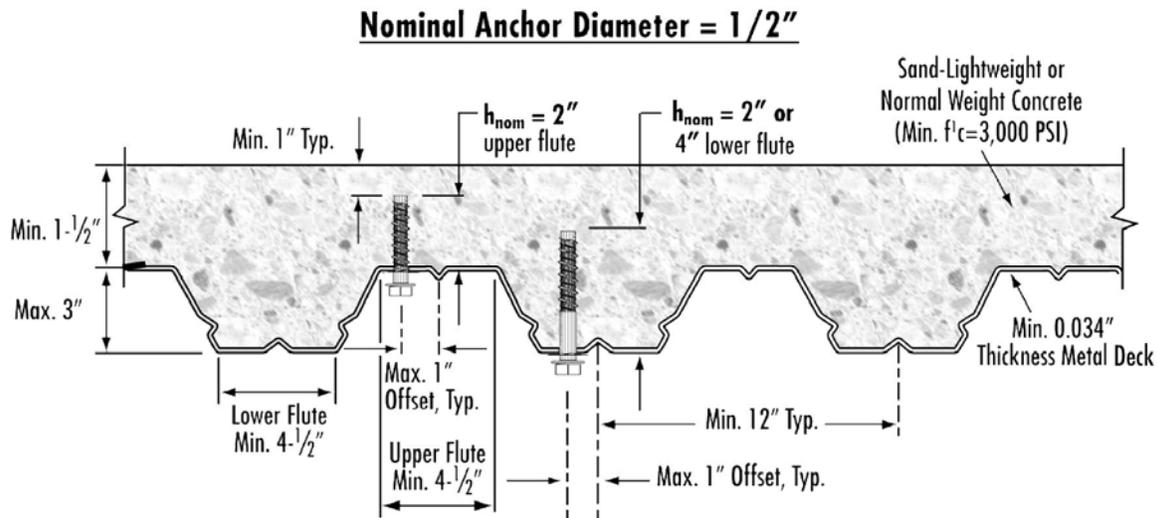


FIGURE 6—TAPCON+ SCREW ANCHOR LOCATED IN THE SOFFIT OF CONCRETE OVER STEEL DECK FLOOR AND ROOF ASSEMBLIES
(1 inch = 25.4 mm)

TABLE 5—TAPCON+ SCREW ANCHOR DESIGN INFORMATION FOR ANCHORS LOCATED IN THE SOFFIT OF CONCRETE OVER STEEL DECK FLOOR AND ROOF ASSEMBLIES^{1,2,3,4,5}

CHARACTERISTIC	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (inch)	
			1/2	
Location of installation	—	—	Lower Flute	Upper Flute
Minimum hole depth	h_{hole}	in.	2 1/2	4 1/2
Nominal embedment depth	h_{nom}	in.	2	4
Minimum effective embedment depth	h_{ef}	in.	1.32	3.02
Characteristic pullout strength, uncracked concrete over metal deck	$N_{p, deck, uncr}$	lbf	1,720	4,950
Characteristic pullout strength, cracked concrete over metal deck	$N_{p, deck, cr}$	lbf	975	2,805
Characteristic shear strength, concrete over metal deck	$V_{sa, deck}$	lbf	3,825	6,130
Characteristic shear strength - seismic, concrete over metal deck	$V_{sa, deck, eq}$	lbf	2,820	4,520
Reduction factor for pullout strength in tension, Condition B	ϕ	—	0.65	
Reduction factor for steel strength in shear, Condition B	ϕ	—	0.60	

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m.

¹Values for $N_{p,dec,uncr}$, $N_{p,dec,cr}$, $V_{sa,deck}$ and $V_{sa,deck,eq}$ apply to sand-lightweight concrete having a minimum concrete compressive strength, f'_c , of 3,000 psi.

²The characteristic pull-out strength for greater concrete compressive strengths shall be increased by multiplying the tabular value by $(f'_c/3,000 \text{ psi})^{0.5}$.

³All values of ϕ apply to the load combinations of IBC Section 1605.2, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4. For installations where reinforcement that complies with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable, requirements for Condition A is present, the appropriate ϕ factor must be determined in accordance with ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable.

⁴The minimum anchor spacing along the flute must be the greater of $3h_{ef}$ or 1.5 times the flute width in accordance with Section 4.1.11 of this report.

⁵Installation must comply with Figure 6 of this report.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

EVALUATION SUBJECT:

TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors for use in cracked and uncracked concrete, described in ICC-ES evaluation report [ESR-3699](#), have also been evaluated for compliance with the codes noted below as adopted by Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2017 *City of Los Angeles Building Code* (LABC)
- 2017 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report [ESR-3699](#), comply with LABC Chapter 19, and LARC, and are subjected to the conditions of use described in this report.

3.0 CONDITIONS OF USE

The Tapcon+ Screw Anchors and SAMMYS Threaded Rod Anchors described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-3699](#).
- The design, installation, conditions of use and labeling of the anchors are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the evaluation report [ESR-3699](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The allowable and strength design values listed in the evaluation report and tables are for the connection of the anchors to the concrete. The connection between the anchors and the connected members shall be checked for capacity (which may govern).

This supplement expires concurrently with the evaluation report, reissued March 2020.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

ITW RED HEAD

EVALUATION SUBJECT:

TAPCON+ SCREW ANCHORS AND SAMMYS THREADED ROD ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tapcon+ Screw Anchors and SAMMYS Anchors for Threaded Rods for use in cracked and uncracked concrete, recognized in ICC-ES evaluation report ESR-3699, have also been evaluated for compliance with the codes noted below.

Compliance with the following codes:

- 2014 *Florida Building Code—Building*
- 2014 *Florida Building Code—Residential*

2.0 PURPOSE OF THIS SUPPLEMENT

The Tapcon+ Screw Anchors and SAMMYS Screw Anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report, ESR-3699, comply with the 2014 *Florida Building Code—Building* and 2014 *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2012 *International Building Code*® (IBC) provisions noted in the evaluation report, and under the following conditions:

- Design wind loads must be based on Section 1609 of the 2014 *Florida Building Code—Building* or Section 301.2.1.1 of the 2014 *Florida Building Code—Residential*, as applicable.
- Load combinations must be in accordance with Section 1605.2 or Section 1605.3 of the 2014 *Florida Building Code—Building*, as applicable.

Use of the Tapcon+ Screw Anchors and SAMMYS Screw Anchors for use in cracked and uncracked concrete, for compliance with the High-Velocity Hurricane Zone provisions of the 2014 *Florida Building Code—Building* and 2014 *Florida Building Code—Residential*, has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 9N-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued March 2020.

Large Diameter Tapcon (LDT) Self-threading



SPECIFIED FOR ANCHORAGE INTO CONCRETE

The LDT anchor is a high performance anchor that cuts its own threads into concrete.

Anchor bodies are made of hardened carbon steel and zinc plated.
Grade 5

The anchors shall have a finished hex washer head with anti-rotation serrations to prevent anchor back-out. The head of the anchor is stamped with a length identification code for easy inspection.

The anchor shall be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994.

LDT 3/8" and 1/2" are available with EnvireX coating

1,000 hours salt spray ASTM B117. Approved for use in ACQ and MCQ lumber*

*Excessive content of copper in the ACQ and MCQ lumber may affect the anchor finish.

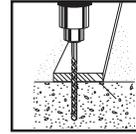
LENGTH INDICATION CODE*

CODE	LENGTH OF ANCHOR In. (mm)	
A	1-1/2 < 2	(38.1 < 50.8)
B	2 < 2-1/2	(50.8 < 63.5)
C	2-1/2 < 3	(63.5 < 76.2)
D	3 < 3-1/2	(76.2 < 88.9)
E	3-1/4 < 4	(88.9 < 101.6)
F	4 < 4-1/2	(101.6 < 114.3)
G	4-1/2 < 5	(114.3 < 127.0)
H	5 < 5-1/2	(127.0 < 139.7)

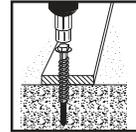
* Located on top of anchor for easy inspection.

INSTALLATION STEPS

Installation Steps for Concrete, Lightweight Concrete and Metal Deck

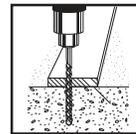


1. Using the proper size carbide bit (see chart) drill a pilot hole at least 1" deeper than anchor embedment.

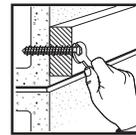


2. Using an **electric impact wrench**, or socket wrench (hand install) insert anchor into hole and tighten anchor until fully seated. (see chart for socket size) (do not over tighten).

Installation Steps for Hollow or Grout-Filled CMU (3/8" and 1/2" diameter)



1. Using a 5/16" (for 3/8" LDT) or 7/16" (for 1/2" LDT) carbide tipped bit, drill a pilot hole at least 1" deeper than anchor embedment.



2. Using a socket wrench insert anchor into hole and hand tighten (only) anchor until fully seated. (9/16" socket for 3/8" and 3/4" socket for 1/2") (do not over tighten).



LDT's can be installed by hand or with an impact wrench

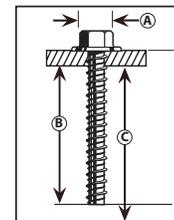
Installation by hand—is easy, simply using a socket wrench



Installation by impact wrench—is recommended for faster installations or for high volume projects. Installation with impact wrench—is **not** recommended for hollow block.

Selection Chart

LDT Size	ANSI Standard Drill Bit Diameter	Ⓐ Anchor Head (Socket Size) Diameter	Washer Diameter	Ⓑ Minimum Embedment	Ⓒ Hole Depth	USE IN		
						Concrete	CMU	
							Hollow	Grout-filled
LDT 3/8"	5/16"	9/16"	13/16"	1-1/2"	2-1/2"	YES	YES	YES
LDT 1/2"	7/16"	3/4"	1"	2-1/2"	3-1/2"	YES	NO	YES
LDT 5/8"	1/2"	13/16"	1-3/16"	2-3/4"	3-3/4"	YES	NO	YES
LDT 3/4"	5/8"	15/16"	1-5/16"	3-1/4"	4-1/4"	YES	NO	YES



Ⓒ See catalog for effective lengths and length indication code.

PERFORMANCE TABLES

LDT Anchors Ultimate Tension and Shear Values (Lbs/kN) in Concrete

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	f'c = 2000 PSI (13.8 MPa)		f'c = 3000 PSI (20.7 MPa)		f'c = 4000 PSI (27.6 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	1,336 (5.9)	2,108 (9.4)	1,652 (7.3)	2,764 (12.3)	1,968 (8.8)	3,416 (15.2)
	2 (50.8)	1,492 (6.6)	3,036 (13.5)	2,024 (9.0)	3,228 (14.4)	2,552 (11.4)	3,420 (15.2)
	2-1/2 (63.5)	3,732 (16.6)	3,312 (14.7)	3,748 (16.7)	3,364 (15.0)	3,760 (16.7)	3,424 (15.2)
	3-1/2 (88.9)	5,396 (24.0)	3,312 (14.7)	6,624 (29.5)	3,368 (15.0)	7,852 (34.9)	3,428 (15.2)
1/2 (12.7)	2 (50.8)	3,580 (15.9)	5,644 (25.1)	3,908 (17.4)	6,512 (29.0)	4,236 (18.8)	7,380 (32.8)
	3-1/2 (88.9)	7,252 (32.3)	6,436 (28.6)	8,044 (35.8)	7,288 (32.4)	8,836 (39.3)	8,140 (36.2)
	4-1/2 (114.3)	10,176 (45.3)	7,384 (32.8)	10,332 (46.0)	7,968 (35.4)	10,488 (46.7)	8,552 (38.0)
5/8 (15.9)	2-3/4 (69.9)	5,276 (23.5)	8,656 (38.5)	6,560 (29.2)	11,064 (49.2)	7,844 (34.8)	13,476 (59.9)
	3-1/2 (88.9)	7,972 (35.5)	10,224 (45.5)	9,848 (43.8)	12,144 (54.0)	11,724 (52.2)	14,060 (62.5)
	4-1/2 (114.3)	11,568 (51.5)	12,316 (54.8)	13,432 (59.8)	13,580 (60.4)	16,892 (75.1)	14,840 (66.0)
3/4 (19.1)	3-1/4 (82.6)	6,876 (30.6)	7,140 (31.8)	9,756 (43.4)	10,728 (47.7)	12,636 (56.2)	14,316 (63.6)
	4-1/2 (114.3)	10,304 (45.8)	13,120 (58.4)	14,424 (64.2)	16,868 (75.0)	18,540 (82.5)	20,612 (91.7)
	5-1/2 (139.7)	13,048 (58.0)	17,908 (79.7)	18,156 (80.8)	21,718 (96.9)	23,268 (103.5)	25,652 (114.1)

LDT Anchors Allowable Tension and Shear Values* (Lbs/kN) in Concrete Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	f'c = 2000 PSI (13.8 MPa)		f'c = 3000 PSI (20.7 MPa)		f'c = 4000 PSI (27.6 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	334 (1.5)	527 (2.3)	413 (1.8)	691 (3.1)	492 (2.1)	854 (3.8)
	2 (50.8)	373 (1.7)	759 (3.4)	506 (2.2)	807 (3.6)	638 (2.8)	855 (3.8)
	2-1/2 (63.5)	933 (4.2)	828 (3.7)	937 (4.2)	841 (3.7)	940 (4.2)	856 (3.8)
	3-1/2 (88.9)	1,349 (6.0)	828 (3.7)	1,656 (7.4)	842 (3.7)	1,963 (8.7)	857 (3.8)
1/2 (12.7)	2 (50.8)	895 (4.0)	1,411 (6.3)	977 (4.3)	1,628 (7.2)	1,059 (4.7)	1,845 (8.2)
	3-1/2 (88.9)	1,813 (8.0)	1,609 (7.2)	2,011 (8.9)	1,822 (8.1)	2,209 (9.8)	2,035 (9.0)
	4-1/2 (114.3)	2,544 (11.3)	1,846 (8.2)	2,583 (11.5)	1,992 (8.9)	2,622 (11.7)	2,138 (9.5)
5/8 (15.9)	2-3/4 (69.9)	1,319 (5.9)	2,164 (9.7)	1,640 (7.3)	2,766 (12.3)	1,961 (8.7)	3,369 (15.0)
	3-1/2 (88.9)	1,993 (8.9)	2,556 (11.4)	2,462 (10.9)	3,036 (13.5)	2,931 (13.0)	3,515 (15.6)
	4-1/2 (114.3)	2,892 (12.9)	3,079 (13.7)	3,358 (14.9)	3,395 (15.1)	4,223 (18.8)	3,710 (16.5)
3/4 (19.1)	3-1/4 (82.6)	1,719 (7.6)	1,785 (7.9)	2,439 (10.8)	2,682 (11.9)	3,159 (14.0)	3,579 (15.9)
	4-1/2 (114.3)	2,576 (11.5)	3,280 (14.6)	3,606 (16.0)	4,217 (18.7)	4,635 (20.6)	5,153 (22.9)
	5-1/2 (139.7)	3,262 (14.5)	4,477 (19.9)	4,539 (20.2)	5,445 (24.2)	5,817 (25.9)	6,413 (28.5)

* Allowable values are based upon a 4 to 1 safety factor. (Ultimate/4)

LDT Anchors Recommended Edge & Spacing Requirements for Tension Loads* Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. EDGE DISTANCE 1-3/4 Inches (44mm)	SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3 Inches (76mm)
3/8 (9.5)	1-1/2 (38.1)	2 (50.8)	70%	6 (152.4)	44%
	2 (50.8)	2 (50.8)	70%	6 (152.4)	44%
	2-1/2 (63.5)	3 (76.2)	70%	6 (152.4)	44%
	3-1/2 (88.9)	4 (101.6)	70%	6 (152.4)	44%
1/2 (12.7)	2 (50.8)	2-1/4 (57.2)	65%	8 (203.2)	27%
	3-1/2 (88.9)	3 (76.2)	65%	8 (203.2)	27%
	4-1/2 (114.3)	4 (101.6)	65%	8 (203.2)	27%

* Edge and spacing distance shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

For 5/8" and 3/4" LDT Anchors, the critical edge distance for these anchors is 10 times the anchor diameter. The edge distance of these anchors may be reduced to 1-3/4" provided a 0.65 load factor is used for tension loads, a 0.15 load factor is used for shear loads applied perpendicular to the edge, or a 0.60 load factor is used for shear loads applied parallel to the edge. Linear interpolation may be used for intermediate edge distances.

PERFORMANCE TABLES

LDT Anchors

Recommended Edge & Spacing Requirements for Shear Loads* Carbon and Stainless Steel

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. EDGE DISTANCE 1-3/4 Inches (44mm)	SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3 Inches (76mm)
3/8 (9.5)	1-1/2 (38.1)	3 (76.2)	25%	6 (152.4)	57%
	2 (50.8)	4 (101.6)	25%	6 (152.4)	57%
	2-1/2 (63.5)	5 (127.0)	25%	6 (152.4)	57%
	3-1/2 (88.9)	5 (127.0)	25%	6 (152.4)	57%
1/2 (12.7)	2 (50.8)	5 (127.0)	25%	8 (203.2)	60%
	3-1/2 (88.9)	5 (127.0)	25%	8 (203.2)	60%
	4-1/2 (114.3)	5-1/2 (139.7)	25%	8 (203.2)	60%

* Edge and spacing distances shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

LDT Anchors

Ultimate Tension Load (Lbs/kN) in Concrete Block (anchors should be installed by hand in hollow block)

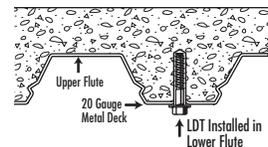
ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	HOLLOW CONCRETE BLOCK		GROUT FILLED CONCRETE BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	916 (4.1)	3,176 (14.1)	1,592 (7.1)	3,900 (17.3)
1/2 (12.7)	2-1/2 (63.5)	N/A	N/A	5,924 (26.4)	6,680 (29.7)

LDT Anchors

Allowable Tension and Shear* (Lbs/kN) in Concrete Block (anchors should be installed by hand in hollow block)

ANCHOR DIA. In. (mm)	EMBEDMENT DEPTH In. (mm)	HOLLOW CONCRETE BLOCK		GROUT FILLED CONCRETE BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1-1/2 (38.1)	229 (1.0)	794 (3.5)	398 (1.8)	975 (4.3)
1/2 (12.7)	2-1/2 (63.5)	N/A	N/A	1,481 (6.6)	1,670 (7.4)

*Allowable values are based upon a 4 to 1 safety factor. (Ultimate/4)



LDT Anchors

Anchoring Overhead in 3000 PSI Lightweight Concrete On Metal Deck

ANCHOR In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT In. (mm) Lbs. (kN)	3000PSI (20.7 MPa) CONCRETE			
				ULTIMATE TENSION LOAD Lbs. (kN)		ALLOWABLE WORKING LOAD
3/8" LDT	5/16 (7.9)	1-1/2 (38.1)	Upper Flute	2,889 (12.9)	722 (3.2)	
			Lower Flute	1,862 (8.3)	465 (2.1)	

PRODUCT DATA SHEET

SikaGrout®-428 FS

High performance, fast setting, non-shrink, cement grout

PRODUCT DESCRIPTION

SikaGrout®-428 FS is a non-shrink, non-metallic, cementitious precision grout powered by ViscoCrete technology. SikaGrout®-428 FS is designed to achieve high early strength and exceptional ultimate strengths at a fluid consistency. A structural, precision grout, SikaGrout®-428 FS can be placed from plastic to fluid over a temperature range.

USES

- For quick turnaround applications, when rate of strength gain is a significant consideration.
- Grouting of railing posts, foundations, windmills, compressors, etc.
- Non-shrink grouting of machinery and equipment, base plates, sole plates, precast panels, beams, columns and curtain walls.

PRODUCT INFORMATION

Packaging	65 lb (29.5 kg) bag
Appearance / Color	Gray powder
Shelf Life	12 months from date of production if stored properly in original, unopened and undamaged sealed packaging
Storage Conditions	Store dry at 40–95 °F (4–35 °C) Protect from moisture. If damp, discard material

- Applications where a non-shrink grout is needed for maximum effective bearing area.
- To transfer optimum load.
- For grouting rebar, bolts, dowels and pins, etc.

CHARACTERISTICS / ADVANTAGES

- Quick rate of strength gain
- Multiple fluidity with one material
- Outstanding performance in fluid state
- Excellent fluidity, sufficient time for placement
- Non-metallic, will not stain or rust

APPROVALS / STANDARDS

- Meet ASTM C-1107 (Grade C)
- Shows positive expansion as per ASTM C-827

TECHNICAL INFORMATION

Compressive Strength

<u>Plastic</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>	(ASTM C-109) 50 % R.H
5 hours	750 psi (5.2 MPa)	2,500 psi (17.2 MPa)	6,000 psi (41.4 MPa)	
6 hours	1,000 psi (6.9 MPa)	3,500 psi (24.1 MPa)	7,000 psi (48.3 MPa)	
1 day	4,000 psi (27.6 MPa)	7,000 psi (48.3 MPa)	9,000 psi (62.1 MPa)	
3 days	5,500 psi (37.9 MPa)	9,500 psi (65.5 MPa)	11,000 psi (75.8 MPa)	
7 days	7,500 psi (51.7 MPa)	12,000 psi (82.7 MPa)	12,000 psi (82.7 MPa)	
28 days	11,000 psi (75.8 MPa)	13,000 psi (89.6 MPa)	13,000 psi (89.6 MPa)	

<u>Flowable</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>
5 hours	500 psi (3.4 MPa)	2,000 psi (13.8 MPa)	5,000 psi (34.5 MPa)
6 hours	750 psi (5.2 MPa)	3,000 psi (20.7 MPa)	5,500 psi (37.9 MPa)
1 day	3,500 psi (24.1 MPa)	7,000 psi (48.3 MPa)	7,000 psi (48.3 MPa)
3 days	5,000 psi (34.5 MPa)	9,000 psi (62.1 MPa)	9,500 psi (65.5 MPa)
7 days	7,000 psi (48.3 MPa)	11,000 psi (75.8 MPa)	11,000 psi (75.8 MPa)
28 days	10,500 psi (72.4 MPa)	12,500 psi (86.2 MPa)	12,500 psi (86.2 MPa)

<u>Fluid</u>	<u>40 °F</u>	<u>73 °F</u>	<u>90 °F</u>
5 hours	< 200 psi (1.4 MPa)	1,000 psi (6.9 MPa)	4,000 psi (27.6 MPa)
6 hours	< 500 psi (3.4 MPa)	3,000 psi (20.7 MPa)	6,000 psi (41.4 MPa)
1 day	3,250 psi (22.4 MPa)	7,500 psi (51.7 MPa)	8,000 psi (55.2 MPa)
3 days	6,000 psi (41.4 MPa)	8,500 psi (58.6 MPa)	8,500 psi (58.6 MPa)
7 days	7,500 psi (51.7 MPa)	10,000 psi (69 MPa)	10,000 psi (69 MPa)
28 days	10,000 psi (69 MPa)	12,000 psi (82.7 MPa)	12,000 psi (82.7 MPa)

Effective Bearing Area > 95 % (ASTM C-1339)

Splitting tensile strength 28 days > 1,000 psi (6.9 MPa) (ASTM C-496)
73 °F (23 °C)
50 % R.H

Pull-Out Resistance	40 °F	73 °F	90 °F	(ASTM C-1583) 50 % R.H
	1 day	200 psi (1.4 MPa)	> 400 psi (2.8 MPa)	
7 days	400 psi (2.8 MPa)	> 500 psi (3.4 MPa)	> 500 psi (3.4 MPa)	
28 days	450 psi (3.1 MPa)	> 550 psi (3.8 MPa)	> 550 psi (3.8 MPa)	

Tensile Adhesion Strength	1 day	1,800 psi (12.4 MPa)	(ASTM C-882 modified)*
	7 days	2,200 psi (15.2 MPa)	
28 days	2,500 psi (17.2 MPa)		

* Mortar scrubbed into substrate at 73 °F (23 °C) and 50 % R.H.

Expansion	40 °F	73 °F	90 °F	(ASTM C-827)
	1 day	Positive	Positive	
7 days	Positive	Positive	Positive	
28 days	Positive	Positive	Positive	

Rapid Chloride Permeability	28 days (60 Volts)	< 1,000 C	(ASTM C-1202 AASHTO T-277)

APPLICATION INFORMATION

Mixing Ratio	Plastic	Flowable	Fluid
	6.5 pts (3.1 L)	7.0 pts (3.3 L)	8 pts (3.8 L)

Coverage	0.50 ft ³ (0.02 m ³) per bag (Coverage figures do not include allowance for surface profile and porosity or material waste)

Layer Thickness	Min.	Max.
	Neat	1/4" (6.4 mm)
Extended	1" (25.4 mm)	6" (152.4 mm)

Flowability	40 °F	73 °F	90 °F	(ASTM C-939 Modified - 3/4" nozzle)
	< 45 sec	> 30 sec	> 30 sec	

Product Temperature	65–75 °F (18–24 °C)

Ambient Air Temperature	> 40 °F (4 °C)

Substrate Temperature	> 40 °F (4 °C)

Pot Life	~ 10 minutes
	As the temperature will affect the pot life, application temperature: <ul style="list-style-type: none"> ▪ Above 73 °F (23 °C) will reduce the fluidity ▪ Below 73 °F (23 °C) will extend the fluidity

Set Time	initial Set	>30 minutes	(ASTM-266) 73 °F (23 °C) 50 % R.H.
	Final Set	>45–60 minutes	

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

0 g/l

(EPA method 24)

LIMITATIONS

- Do not use as a patching or overlay mortar or in unconfined areas.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur® 32 Hi-Mod.

APPLICATION INSTRUCTIONS

SURFACE PREPARATION

- Surface must be clean and sound. Remove all deteriorated concrete, dirt, oil, grease, and other bond-inhibiting materials from the area to be repaired.
- Anchor bolts to be grouted must be de-greased with suitable solvent.
- Preparation work should be done by high pressure water blast, scabblor or other appropriate mechanical means to promote mechanical adhesion.
- To ensure optimum repair results, the effectiveness of decontamination and preparation should be assessed by a pull-off test.
- Substrate should be Saturated Surface Dry (SSD) with clean water prior to application. No standing water should remain during application.

FORMING

- For pourable grout, construct forms to retain grout without leakage.
- Forms should be lined or coated with bond-breaker for easy removal.
- Forms should be sufficiently high to accommodate head of grout.
- Where grout-tight form is difficult to achieve, use SikaGrout®-428 FS in dry pack consistency.

MIXING

- Make sure all forming, mixing, placing, and clean-up materials are on hand.
- Add the appropriate amount of water (depend on the desired flow) of clean potable water (approx 70 °F) into a suitably sized and clean mixing container, using a calibrated measuring jug, or similar, to ensure strict control of the water content (do not over-water).
- Add 1 bag while continuing to mix with a low-speed drill (400-600 rpm) and Sika mixing paddle or a jiffy paddle or in an appropriate mortar mixer.
- Once all the powder has been added, mix for approximately 3 minutes, until a lump-free and uniform consistency is achieved.
- Do not over mix.
- For warmer temperatures use cold water and for colder temperatures use warm water.
- For cold temperature start with 7/8 of a gallon and add remaining 1/8, only if needed for fluid consistency.
- Refer to ACI 306 Guidelines when there is a need to place this grout in cold & hot temperatures.

EXTENSION WITH AGGREGATES

- For deeper applications, SikaGrout®-428 FS may be extended with 3/8" (9.5 mm) pea gravel (plastic and flowable consistencies only).
- The aggregate must be non-reactive (reference ASTM C-1260, C-227 and C-289), clean, well graded, Saturated Surface Dry (SSD), have low absorption and high density, and comply with ASTM C-33 size number 8 per Table 2.
- Variances in aggregate may result in different strengths.
- The addition rate is 30 lb (13.7 kg) of aggregate per bag. It is approximately 2.4 gal (9.1 L) by loose volume of aggregate.

APPLICATION

- Within no more than 10 minutes after mixing, place grout into forms in normal manner to avoid air entrapment.
- Mixed grout in mass will result in faster than expected setting times.
- Plan jobs accordingly so that the grout can be placed right after mixing.
- Vibrate, ram grout as necessary to achieve flow or compaction.
- SikaGrout®-428 FS must be confined leaving minimum exposed surface.
- After grout has achieved final set, remove forms, trim or shape exposed grout shoulders to designed profile.
- Wet cure for a minimum of 3 days or apply a water based curing compound which complies with ASTM C-309 on exposed surfaces.

OTHER RESTRICTIONS

See Legal Disclaimer.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the

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Product Data Sheet
SikaGrout®-428 FS
November 2020, Version 01.02
020201010010000107

product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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PROPOSER NAME:

Base Pricing

ITEM	VALUE
Bonds	\$ -
Temporary construction items	\$ -
CMU repairs	\$ -
Preparations & repainting	\$ -
Burn room liner	\$ -
Total	\$ -

Alternate Pricing (includes any additional costs for bonds, temporary const. items, etc.)

ITEM	VALUE
Clean and regrout all other exterior CMU	\$ -
Clean & repaint all other exposed exterior steel	\$ -