GRANGER

ADVANCE THE ART OF BUILDING

PROJECT MANUAL

Dexter High School – New Field House

Bid Package #4
TMP Project # - 25026E
3/4/2026

Owner:

Dexter Community Schools
2704 Baker Street
Dexter, MI 48130

Project Site:

New Field House
2200 North Parker Rd.
Dexter, MI 48130

Construction Manager:

Granger Construction Company
6267 Aurelius Road
Lansing, MI 48911

Architect/Engineer:

TMP Architecture, Inc.
1191 W. Square Lake Road
Bloomfield Hills, MI 48302

Structural Consultant

William A Kibbe & Associates
1475 S. Washington Ave.
Saginaw, MI 48601

Civil Consultant:

Beckett & Raeder, INC.
535 William Srette suite 101
Ann Arbor, MI 48103

Mechanical Consultant

Peter Basso Associates, INC.
5145 Livernois Rd. suite 100

Electrical Consultant

Peter Basso Associates, INC.
5145 Livernois Rd. suite 100 Troy, MI 48098
Troy, MI 48098

Hardware Consultant

Jenosky Consulting
43422 W. Oaks Dr.
Novi, MI 48377

Technology Consultant

Comtech Design
6581 Belding rd. NE suite 101
Rockford, MI 49341

Geotechnical Investigation Consultant:

G2 Consulting Group
1866 Woodslee St.
Troy, MI 48083

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NOTICE TO BIDDERS

Invitation is hereby made to have qualified bidders submit bid proposals for the following work categories:

03-01 – Cast-in-Place (Building Concrete)
04-01 – Masonry
06-01 – General Trades
08-01 – Glass & Glazing
09-01 – Drywall & Acoustical Ceilings
09-02 – Resilient Flooring
09-03 – Hard Tile
09-04 – Painting
11-01 – Equipment
14-01 – Conveying Equipment
21-01 – Fire Suppression
22-01 – Plumbing
23-01 – Mechanical & Controls
26-01 – Electrical
28-01 – Electrical Safety & Security
32-04 – Artificial Turf

To be bid at a later date via Post Bid Addendum (April 2026):

31-01 – Earthwork & Site Utilities
32-01 – Site Concrete
32-02 – Asphalt Paving
32-03 – Landscaping

Separate sealed bid proposals for the above work categories must be received as a "single lump sum proposal" prior to 2:00 PM, eastern, on 3/26/2026 electronically via BuildingConnected.

All questions, pre-bid RFIs, and substitution requests must be submitted via BuildingConnected messages prior to at **, eastern.**

- A virtual public bid opening will be held on **3/26/2026** at **2:00 PM**, eastern. A Microsoft Teams link will be sent via BuildingConnected messages.
- An optional virtual **Pre-Bid Meeting will be held on 3/12/2026** at **1:00 PM** eastern. A Microsoft Teams Link will be sent via BuildingConnected Messages if a virtual Pre-Bid Meeting is scheduled.
- Click or tap here to enter text.All bid documents including plans and specifications can be found in the files section of BuildingConnected via invite. Click or tap here to enter text.
    - https://app.buildingconnected.com/public/5565f9b93ad9f70800b26d32

Please note that bids will only be accepted via BuildingConnected. Please contact Mallory Anspaugh, Bid Coordinator, at 517-318-4214 or manspaugh@grangerconstruction.com if you need to confirm you have proper access.

Click or tap here to enter text.

Disclose on the electronic bid form if any familial relationship exists between the bidder or any employee of the bidder and any member of owner. If so, a sworn and notarized statement on firm's letterhead disclosing that relationship must be uploaded with your bid submission.

The owner reserves the right to reject any or all proposals, to accept other than a low bid, and to waive informalities, irregularities and/or errors in proposals, which they feel is in their best interest.

END OF SECTION

SECTION 00 1153

PREQUALIFICATION CRITERIA

Granger Construction Company utilizes TradeTapp by BuildingConnected for prequalification submissions. Depending on specific project requirements, Bidders will receive an invite to prequalify either pre or post bid. Bidders will utilize the Qualifications section of BuildingConnected to complete the electronic questionnaire and upload the requested attachments. There is no cost to the Bidder to complete the prequalification and you are able to leverage your stored qualification data to easily transfer to other Construction Managers that also utilize this software. Please note that submissions are generally valid for up to one year and you will be asked to resubmit some or all of the requested information.

Satisfactory evidence of the following items must be submitted for prequalification approval. Bidders who: 1) do not submit all requested data, 2) do not meet criteria shown or 3) who present inaccurate data, may not be offered a subcontract. Submission of a bid proposal shall be evidence the Bidder understands and agrees that the Construction Manager has the right to reject as non-responsive any bid proposal which is not in full compliance with these criteria. **Please note that the Work-In-Progress Schedule and Financial Documents are integral and we are unable to process your prequalification without them. We keep this information confidential.**

1. **GENERAL:**
   A. Company Name
   B. Parent Company (if applicable)
   C. Firm's Founding Year and Location
   D. Business Tax ID
   E. Type of Work Performed
   F. Markets Served
   G. Regions Served
   H. Number of Home Office and Field Employees
   I. Enterprise Business Certifications
   J. Union Affiliations
   K. Company Contacts
2. **PROJECT:**
   A. Current Estimated Backlog (only for projects currently in progress)
   B. Work-in-Progress Schedule: Provide a complete work-in-progress schedule for all work under contract, showing % complete, notice of any claims in process, resolved, or anticipated.
   C. Provide three (3) completed reference projects with contracts of similar size and complexity all of which was under this firm's contractual responsibility. Identify location, completion year, subcontract value, subcontract scope, reference contact information, and project name.
   D. Project History with Granger Construction Company (including recently completed projects if applicable)
   E. Indication of failure to complete a contract (additional information may be requested)

F. Claim History (additional information may be requested)
G. Litigation or Arbitration History (additional information may be requested)

3. SAFETY:

A. Last three (3) Worker's Compensation Experience Modification Ratings (EMR) and attach corresponding EMR Letters. An EMR of less than one (EMR<1.0) is desired.

4. **INSURANCE:**

A. Broker or Agency Contact for Insurance Programs
B. Details of current General Liability, Workers' Compensation, Umbrella/Excess, and Automobile Liability Insurance Policies including the below information.
   i. Per occurrent limit
   ii. Aggregate limit
   iii. Carrier
   iv. Policy Expiration
C. Upload copies of current Certificates of Insurances (COIs). Insurance shall be proffered by U.S. domiciled firm, licensed to conduct business within the State of Michigan and rated by A.M. Best as A-, financial category FSC IV or better. Policy shall not be canceled or withdrawn unless it is replaced by a policy with no lapse in coverage which meets the same criteria for the duration of the contract through completion of the one year warranty obligation.
D. Upload additional insured endorsement(s) to all applicable policies
E. Details of current Surety/Bonding Program including the below information.
   i. Contact
   ii. Single Project Bonding Capacity
   iii. Aggregate Bonding Capacity
   iv. Upload Bonding Capacity Letter

5. FINANCIAL:

A. Upload current IRS form W-9
B. Current banking details including the below information.
   i. Contact
   ii. Total line of credit
   iii. Line of credit available
C. Provide your historical annual volume/revenue. These values should generally match what appears on the Statement of Income from your company's annual financial statements.
D. Upload your most recent financial statement including balance sheet and statement of income ("P&L"). CPA Audited or Reviewed statements are preferred. If you provide a compiled or incomplete financial statement, your application may be rejected. **Please note if parent company financials are submitted, the parent company will be required to sign a Parent Company Guarantee.**
E. Confirm if Payroll Taxes and Fringe Benefits are paid to date.

END OF SECTION

SECTION 00 2113

INSTRUCTIONS TO BIDDERS

1. **BID SUBMISSION:** Bids are to be submitted as follows on BuildingConnected no later than time & date listed in the Notice to Bidders section, for all bid categories. BuildingConnected will not allow you to submit bids past the due date and time. Due to varying internet speeds, we highly recommend you submit early.
2. **BID FORM:** Use the Electronic Bid Form via BuildingConnected. Do not modify, alter, qualify, or attach stipulations to your Bid Form. The Owner and the Construction Manager reserve the right to reject such bids as non-responsive.
3. **BID DOCUMENTS:** Bid documents for this project are available on the project bidding site. Instructions for accessing the bid documents are located in Section 00 1116 Notice to Bidders.
4. **MILESTONE SCHEDULE:** Work on this bid package must be performed according to the Project Milestone Schedule which is described in Section 01 3216 Project Scheduling, herein and Appendix C – Project Schedule, if applicable.
5. **HAZARD COMMUNICATION STATEMENT:** Under no circumstances are Bidders to disturb Asbestos Containing Materials (ACM) or other hazardous materials without appropriate engineering controls. The Owner's Hazard Communication Program and MSDS sheets appropriate to the facility are also available from the Construction Manager.
6. **EXTRA WORK FEES:** For any additional work performed upon authorization of Owner, Bidder agrees to accept the following fees:
   A. Reimbursable labor must be expended at the Project Site and must include hourly wage rate plus all insurance, taxes, health and welfare contributions and other employee benefits. No other miscellaneous fees, allowances, off site labor, or Overhead costs are allowed; overhead includes all costs not directly expended at the Project Site. All change requests shall include a complete breakdown of labor, material, equipment, hours, rates & costs including breakdown of subcontractor and supplier costs when requested by the CM.
   B. Additional bond premiums will be allowed at net invoice charge. A cost breakdown of all wages, material and vendor invoices must be submitted with all extra work to contracts.
   C. Markups are based on amounts determined after all applicable discounts are applied. Costs exclude warehousing, small tools or estimating charges that are part of overhead.
   D. Extra Work Fee Schedule:
      Maximum Allowable Markup on Subcontractor Changes: 15%

      Maximum Allowable Markup on Second-Tier Subcontractor Changes: 7.5%

      If changes are given to the Construction Manager after 14 business days, the maximum allowable markup is reduced by 50%. If changes are given to the Construction Manager after 28 business days, no markup will be accepted.
7. **CREDIT FOR WORK DELETED:** Should any work be deleted from Contract by order of Owner, full cost savings realized thereby will be credited to Owner.

8. **UNIT PRICES:** Unit prices quoted shall be acceptable to the Subcontractor as full compensation for extra work required by the Owner and as just credit to the Owner for work deleted from the Contract after reduction by the contractually allowed mark-up for overhead and profit. Required Unit Prices will be listed on the electronic bid form Bid Proposals submitted without required Unit Prices may be rejected. It is agreed that the decision to utilize or not to utilize Unit Prices for changes in the Work will be made at the discretion of the Construction Manager or the Owner.
9. **MATERIAL ALLOWANCES:**
   A. Purchase product/material under allowance only as specified, or as directed by the Construction Manager. The amount of allowance includes: net cost of product, delivery to the site and applicable taxes. In addition to the amount of the allowance, include in Base Bid, for inclusion in Contract Sum, Contractor's costs for handling at site including unloading, uncrating and storage; protection from elements, from damage; labor, installation and finishing; other expenses (e.g., testing, adjusting and balancing) required to complete installation; overhead and profit.
   B. After selection of material by Architect/Engineer and Owner, the contract prices will be adjusted by Change Order to reflect charges, plus or minus, from the allowance.
   C. Selection of product/material: the Architect/Engineer will consult with Contractor in consideration of product/material and suppliers, make selection, designate product or material to be used and notify the Contractor in writing to designate product size, color and texture, supplier, and cost. The Contractor shall assist and make appropriate recommendations to the Architect/Engineer in determining qualified suppliers. The Contractor will also obtain proposals from suppliers when requested by the Architect/Engineer. The Contractor will notify the Architect/Engineer, in writing, of the anticipated effect the selection will have on contract sum and duration. The Contractor is responsible for arranging delivery, unloading, prompt inspection of product for damage and defects, and submitting claims for transportation damage.
   D. Unused funds included under allowances shall be credited to the Owner by deduct Change Order prior to approval of Final Application for Payment.
   E. **Material Allowances are indicated in the Scope of Work descriptions**.
10. **GENERAL/SCOPE ALLOWANCES:**
   A. Provide labor and/or material for scope of work as directed by the Construction Manager. Work performed under general/scope allowance(s) shall be quoted in a similar manner as Extra Work, as described in Item 9 of this section.
   B. Unused funds included under allowances shall be credited to the Owner by deduct Change Order, prior to approval of Final Application for Payment.
   C. General/Scope Allowances are indicated in Scope of Work descriptions detailed in Appendix B.
11. **REQUIRED/MANDATORY ALTERNATES:** Subcontractor agrees that prices quoted for Required Alternates (to be quoted on Bid Form) shall be acceptable as full compensation for work thus described in the drawings, specifications, and Appendix B – Scopes of Work. Subcontractor understands the Owner reserves the right to elect to utilize these prices at the discretion of the Construction Manager and the Owner. It is understood that this Subcontractor's performance and timeliness in the Work described as Lump Sum Base Bid will be considered in the decision to authorize this Subcontractor to proceed with any Alternates. It is also agreed that the Owner may

elect to add or delete any or all Alternates to or from a Subcontractor's Work at any time during the project, as is practical, for the stipulated sums quoted. The Owner and the Construction Manager reserve the right to award this Contract on the basis of any combination of Required and Voluntary Alternates, if in their best interest to do so. See Electronic BuildingConnected Bid Form and Appendix B – Scopes of Work for description of alternates.

12. **VOLUNTARY ALTERNATES:** Voluntary Alternates must be adequately detailed to allow acceptance or rejection as presented. The Owner may not consider Voluntary Alternates if the requested Lump Sum Base Bid, Unit Prices, and Requested Alternates are not offered. The Owner and the Construction Manager reserve the right to award this Contract on the basis of any combination of Requested and Voluntary Alternates, if in their best interest to do so. Should add language here about where they can submit voluntary alternates on BC.
13. **PERFORMANCE AND LABOR AND MATERIAL BONDS**
    A. The bidder, if awarded the Contract, may be required by the Owner or the Construction Manager to provide, a Performance Bond and a Labor and Material Payment bond, covering up to the full amount of the Contract sum as security for the faithful performance of all work under the Contract and payment of all charges in connection therewith. Such bonds must be furnished within 15 days of the request for the bonds. The cost to provide performance and labor and material payment bonds will be priced as a separate add option (Refer to the Electronic Bid Proposal Form on BuildingConnected). Bonds signed by attorney-in-fact must be accompanied by a certified and effectively dated copy of their power of attorney. Performance and labor and material payment bonds will not be required for proposals less than $50,000.00. Granger Construction Company shall be the named obligee and the Owner may be named dual obligee on the bonds. Bonds shall be submitted on the current AIA Form A312 unless otherwise specified.
    B. It is required that the surety company complies with the following:
    Insurance and Surety companies shall be deemed qualified and acceptable in connection with Contractor bonding and insurance requirements under said contracts only if such companies have a policy holders rating of A- or higher and a financial category not less than Class IV or better, as shown on Best's Key Rating Guide, latest edition. We should get Duprey to review this and make sure it is current.
14. **BIDDERS EXAMINATION OF PREMISES AND THE CONTRACT DOCUMENTS:** Each Bidder shall visit the site(s) to become familiar with local conditions affecting the job. This visit must be coordinated with the Construction Manager. Each Bidder shall take their own measurements and be responsible for the correctness of those measurements. Each Bidder shall be held to have made such examinations and no allowances will be made in their behalf by reason of error or omission on their part. If any portion of the Bidder's work depends, for proper results, upon existing conditions, the Bidder shall notify the Construction Manager of any conditions or defects that will affect the results. Failure to notify will constitute the Bidder's acceptance of the conditions.

    Each Bidder shall examine the bidding documents carefully. In the event that the documents require interpretation or correction of any inconsistency, ambiguity, or error, the Bidder will notify the Construction Manager in writing via BuildingConnected Messages prior to the deadline listed in

Section 00 1116 Notice to Bidders for clarification by written addenda. If such interpretation is not requested, the bid will be presumed to be based on the interpretation and instructions given by the Architect, and / or Construction Manager after the Subcontractor Agreement is executed, and in accordance with the terms of that Agreement. Only a written interpretation or correction prior to the bid due date will be binding. Neither the Owner, Architect nor Construction Manager will be responsible for any verbal explanations or interpretations of the Contract Documents.

Plans, diagrams and other descriptive information that depict existing conditions are provided for scope identification and scheduling purposes only - dimensions should not be scaled. Quantities, elevations, measurements and locations shown may have been approximated and/or gathered from dated, incomplete original construction documents. Therefore, this data should not be used for bidding purposes without field verification by the bidder.

The Contract Documents are intended to provide sufficient information and intent for the Bidder to assume responsibility for all Work and Materials necessary for proper completion of the Work. The Bidder's own site inspection or contract document review of the work areas shall be relied upon to provide the bidder all other information they may require to properly execute and complete the Work. If inspection presents any unanswered questions, they must be submitted in writing to the Construction Manager as described above.

Failure to request any required written clarification by addenda and submission of a Bid Proposal shall constitute acceptance of all contract document terms and conditions.

Each bidder, by submitting a bid, represents that the bidder has read and understands the bidding documents, has satisfied themself as to the extent of the proposed work by personal examination of the site and surroundings, is familiar with the local conditions and weather extremes under which the work is to be performed and has made their own estimate there from of the equipment, labor, facilities and difficulties attending the performance and completion of the work.

15. **SUBSTITUTIONS:**
    A. To obtain approval to use unspecified products in the base bid, bidders shall submit written requests via BuildingConnected Messages prior to the deadline listed in Section 00 1116 Notice to Bidders. Each such request shall include a complete description of the proposed substitute and the name and specification section of the material or equipment for which it is to be substituted. Requests shall clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. If the product is acceptable, the Architect will approve it in an Addendum issued to all plan holders of record. Reference Appendix G for the form to use for this process.
16. **BIDDING PROCEDURES:**
    A. BuildingConnected will not allow bids to be submitted past the due date and time.
    B. Prior to the receipt of bids, addenda will be posted to the project bidding site. No addendum will be issued later than three (3) days prior to the date for receipt of bids except an addendum, if

necessary, postponing the date for receipt of bids or withdrawing the request for bids. Each bidder shall ascertain, prior to submitting a bid, that he/she has reviewed all addenda issued and shall acknowledge such on the Bid Proposal Form.

C. All bids must be submitted as follows:
   - Corporations: Submission from an official shall be accompanied by a certified copy of the resolution of the board of directors authorizing the individual signing to bind the corporation.
   - Partnerships: A certified copy of the power of attorney authorizing the individual submitted to bind all partners shall accompany the submission of one partner. If a certified copy of the partnership's certificate submitted with the bid indicates that all partners have signed, no authorization is required.
   - Bids submitted by joint ventures shall be signed by one of the joint ventures and shall be accompanied by a certified copy of the power of attorney authorizing the individual submitting to bind all the joint ventures. If a certified copy of the joint venture's' certificate submitted with the bid indicates that all joint ventures have signed, no authorization is required.
   - Individual submitting on own behalf: No authorization is required.
   - Individual submitting on behalf of another: Power of attorney or comparable evidence of authority shall accompany bid.

D. No responsibility shall attach to the Construction Manager, the Owner, or the authorized representatives of either one, for the premature opening of any proposal that is not properly addressed, delivered and identified.

E. The bidder shall assume full responsibility for timely delivery of bid to the location designated.

F. Negligence in preparation, improper preparation, errors in and/or omissions from the bid shall not relieve the bidder from fulfillment of any and all applicable obligations and requirements of the Contract documents.

17. **CONSIDERATION OF BIDS:**

A. The bidder acknowledges the right of the Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of the Owner to reject a bid:
   - If the bidder fails to furnish any required bid security, or fails to submit the data required by the bidding documents; or
   - If the bid is in any way incomplete or irregular; or
   - If the bidder's performance as a contractor was unsatisfactory under a prior contract for the construction, repair, modification, or demolition of a facility with the Owner or the Construction Manager; or
   - For known poor performance by the bidder; or
   - Inadequate financial condition.

B. It is the intent of the Owner to award a Contract to the lowest responsible bidder provided the bid has been submitted in accordance with the requirements of the bidding documents and does not exceed the funds available.

C. Bidders will be required to submit to the Construction Manager a properly executed Prequalification in accordance with section 00 11 53 Prequalification Criteria.

18. **BID SECURITY:**
    A. A bid security will be required for all proposals.
    B. All proposals over $50,000 shall be accompanied by a satisfactory bid bond executed by the bidder and an approved security company in an amount of not less than five percent (5%) of the final base bid sum. For bids less than $50,000 a certified check in the amount of 5% of the bid will be allowed as bid security.
    C. The amount of the bid bond shall be forfeited to the Owner upon failure of the successful bidder to enter into a contract within fifteen (15) days after acceptance of the proposal.
    D. The providing of security hereunder shall entitle the Owner to recover the full amount of the difference between the bid submitted and the amount for which the Owner ultimately contracts for the work, but not more than the 5% bid bond.
    E. Bid security signed by attorney-in-fact must be accompanied by a certified and effectively dated copy of their power of attorney.
    F. The bid security shall be made out to **Owner.**
    G. Minimum surety requirements are included herein under requirements for Performance and Labor and Material Bonds.
19. **WORKFORCE DIVERSITY FOR SUBCONTRACTORS AND SUPPLIERS:**
    A. Bidders are encouraged to make a continuous effort to broaden their business relationships with diverse owned businesses including but not limited to Minority Business Enterprises (MBE), Women-Owned Business Enterprises (WBE), Veteran & Service Disabled Veteran Owned Business Enterprises (VBE/SDVBE), Small Business Enterprises (SBE), and Federal HUBZONE Businesses. For the purposes of this provision, suppliers are considered subcontractors. If third parties are needed to fulfill contractual obligations, bidders are encouraged to consider all qualified sources, including historically disadvantaged businesses.
20. **DEXTER COMMUNITY SCHOOLS SECURITY/BACKGROUND CHECK CERTIFICATION:**
    A. Each contractor/supplier will be required to certify background checks of employees who will be performing services for DCS. Employees with pending felony charge(s), felony conviction, pending misdemeanor charge(s), misdemeanor conviction will not be permitted to work at an DCS facility. DCS reserves the right to waive restrictions based on the charge(s) and/or conviction is disclosed. Background Check Form/Information available via Building Connected.
21. **AWARD OF TRADE CONTRACTS:**
    A. Prevailing Wages or Federal Davis – Bacon Prevailing Wages and reporting requirements are required for this project. The applicable prevailing wage rate information issued for this project is also referenced in Section 00 3132 – Information Available to Bidders, and must be considered when preparing your proposal(s). For Prevailing Wage projects, all trade contractors that utilize labor at the project site will be responsible to:
        - Prevailing Wages (available at https://www.michigan.gov/leo/bureaus-agencies/ber/wage-and-hour/prevailing-wage) and reporting requirements are required for this project,

- contractors and subcontractors that employ construction mechanics must register annually with the Wage and Hour Division before bidding on or working on any State Project. By visiting the website indicated above, contractors and subcontractors can follow the prompts for registration. Be prepared to provide your registration number to CM prior to or at post bid interview.
- comply fully with the work rules, hourly wage/benefit requirements (including overtime requirements) and classification requirements as published in the Wage Rate Schedule provided for this project,
- provide the CM with monthly certified payroll reports showing payments to all construction mechanics employed at the site,
- ensure that lower tier subcontractors fully comply with the above referenced standards and reporting requirements,
- collect certified payrolls from lower tier subcontractors for any period(s) they utilize construction mechanics at the project jobsite(s),
- resolve any and all claims with the governing authority brought by their employees and the employees of any tier subcontractor performing work on the project site to satisfy the requirements of their work category, and hold the Owner and Construction Manager harmless from any such claims.

22. **PROJECT MILESTONE SCHEDULE:**
    A. **PEMB Site Clearing and Prep: 7/2/2026 – 8/5/2026**
    B. **PEMB Footings and Foundations: 7/23/26 – 9/9/2026**
    C. **PEMB & Mezzanine Erection: 8/13/2026 – 10/7/2026**
    D. **PEMB Roofing Installation: 9/17/2026 – 10/28/2026**
    E. **PEMB Interior & Finishes: 10/28/2026 – 8/16/2027**
    F. **PEMB Civil & Landscaping: 4/5/2027 – 8/16/2027**

23. **GENERAL SCOPE OF WORK CLARIFICATIONS:**
    Bidders of ALL Work Categories shall include all Work, compliance, and costs for compliance with the Appendices, the Bidding Requirements, General Conditions, General Requirements (Specification Sections 00 0001 through 01 7000) and Drawings/Specifications as prepared by TMP Architecture provided in Appendix A, including all addenda. Should any conflict exist between a Bid Category written scope of work and the scope of work inferred by the specifications (ALL Divisions), the work required by the bid category written scope of work shall govern. Particular emphasis is placed on the following requirements, which are stated below for emphasis and clarity. All Bidders of any category must include:
    A. Development of a complete understanding of other work categories and provide continuous coordination with interfacing trade contract work of other categories.
    B. All layout, control points and engineering required for work of the category being bid as required to execute the work, and as defined in these specifications.
    C. Labor, tools, equipment, incidental hardware and materials required to receive, unload, store, protect and install work of the category as well as materials furnished by other categories but

required to be installed as a requirement of the category being bid. All bidders to include all necessary equipment and operator time for loading and unloading material and equipment on site.

D. Bidders shall be aware that compliance with the Granger Construction Safety & Health Program Manual will be required of each subcontractor and/or sub-subcontractor, in addition to compliance with all Federal and State OSHA standards.
E. Submittal within ten (10) days, of award, as defined by Section 01 3300.
F. Continuous trash removal and clean up required per Section 01 7000 – Execution Requirements.
G. Bidders shall be aware of delivery requirements to accommodate the completion schedule of this project and shall include all expediting and overtime costs to allow for completion and turnover as shown in the milestone schedule. It is the Bidder's responsibility to prepare and submit shop drawings and other submittals in a timely manner to accommodate the milestone and progress schedule and prevent delays to the project.
H. The documents necessary for preparation of a responsive bid in this category are the technical specifications and drawings prepared by TMP Architecture dated February 26, 2026 (TMP Project Number – 25026E).
I. Background checks are required. CM will initiate the background check process. All employees working on school property will be subject to background check prior to arriving on site.
J. No tobacco products or vaping permitted on school property. Bidders shall be aware of State of Michigan tobacco free requirements on school property.
K. Provide continuous coordination with Owner's testing agent (if required) as well as interfacing trade contract work of other contract categories as required to accomplish work of this category.
L. Storage of materials, equipment and site offices will need to be coordinated with the CM. Space may be limited on site and deliveries will need to be scheduled. Notify CM 24 hours in advance of deliveries.
M. Dumpsters/removal of all demolition materials/debris by demolition contractor. Dumpsters for general waste and debris will be provided by CM.
N. All bidders are required to adjust temporary fencing to accommodate execution of work. Coordinate with CM prior to adjusting fencing.
O. Onsite foreman to participate in daily huddles (15 minutes) with the CM Superintendent and other trade foreman at a designated time as well as weekly scheduling meetings in the Granger Trailer/Field Office
P. Onsite foreman/superintendent/competent person to have tablet with Procore and appropriate internet plan for use at all times.
Q. Notify CM of any discrepancies between the drawings before removal/re-work of the work in question.
R. Include and define in your proposal expediting costs for long lead time of greater than 4-6 weeks as separate line item.
S. Installation, sanding, cutting and cleanup to be complete as per MIOSHA Silica Requirements.
T. All overhead work will need to be complete before any finish surface work is started.
U. Standard warranty is 1-year from date of substantial completion, as determined by Architect.
V. The following technical specifications apply to all bid categories as it applies to specific scope:
    - 07 8400 Firestopping
    - 07 9200 Joint Sealants

W. **Clarifications and bidding information for all Civil related Scope of Work/Bid Categories. Some information below applies to other bid categories.**

- **The following Bid Categories will be bid via post bid addendum in late March or early April:**
  - 31-01 – Earthwork & Site Utilities
  - 32-01 – Site Concrete
  - 32-02 – Asphalt Paving
  - 32-03 – Landscaping
- **Civil clarifications:**
  - Tree clearing for the Field House, Parking Lots, and Drives has already been completed.
  - Tree clearing for the spoils stockpile area will be completed by others.
  - Bid Category 31-01 will be responsible for a stump removal for both areas where trees are removed.
  - Bid Category 31-01 will be responsible for set-up and stone for temporary access roads, crane pads, silt fencing and contractor parking lot.
  - Bid Category 31- will provide necessary protection for all open holes, trenches, and excavations.
  - Bid Category 31-01 will be responsible for dewatering as needed for the project site and work.
  - Bid Category 31-01 will be responsible for transporting spoils from "identified soil pile area" to the permanent stockpile area for all underground utility work from Plumbing, Fire Suppression and Electrical. All MEP are responsible for transporting soils from trenched areas to "identified soil pile area" outside of building footprint area.
  - Bid Category 31-01 will be responsible for excavation for structural footing/foundations and building structure.
  - Bid Category 31-01 will be responsible for all subgrade materials for the Artificial Turf area.
  - Bid Category 31-01 will be responsible for all fine grading for the complete project area.
  - Bid Category 31-01 will have multiple mobilizations for fine grading of various areas as indicated by CM team.
  - Bid Category 31-01 will be responsible for all perimeter foundation drainage and hock-up.
  - Bid Category 31-01 will bring underground site utilities within 5-ft of building perimeter for connection by mechanical/plumbing and fire protection contractors.
  - Bid Category 31-01 will be responsible for permitting: roadway, wetland, SESC, etc.
  - Bid Category 31-01 will create site access off Parker Road with access road leading to jobsite. (see site logistic plan)
  - Bid Category 31-01 will be responsible for excavation, backfilling and compaction for building foundations.
  - Bid Category 31-01 will be responsible to furnish and install rigid foundation insulation as required.

24. **PROJECT DOCUMENT MANAGEMENT**: All project documents, including but not limited to Drawings, Specifications, Bulletins, Addenda, Field Mark-Ups, RFI, sketches, Punch Lists, and Warranty Issues,

will be managed and distributed exclusively through Procore application. All successful bidders are required to have a subscription to this application for the duration of the entire Project, including the warranty period. All field foremen are required to be in possession of an electronic tablet (iPad preferred) with a cellular data plan included and a minimum of 32 GB storage. Document management and quality control will be administered via electronic device in the field, using Procore.

25. **BIM COORDINATION:** The following Bid Categories will participate in BIM coordination, with Granger Construction as the lead BIM coordinator. Provide fully coordinated, and detailed, electronic shop drawings in 3D software compatible with Revit®, for weekly BIM coordination meetings that will be managed in Navisworks®.
26. **LEAN:** Lean initiatives will be implemented throughout the project to improve reliability, planning, quality, safety, and team performance. Project planning and scheduling will utilize the Last Planner production system. This will require attendance by the project manager and foreman at periodic pull planning and phasing meetings. Weekly planning meetings and daily onsite huddles must be attended by the site foreman. Subcontractors shall input, maintain, and update their work activities, manpower, and issues.
27. **BID BREAKDOWN:** A completed Bid Breakdown is required to be submitted by bidders invited to a Post-Bid Interview. The Excel Bid Breakdown templates will be uploaded to the Building Connected files section prior to the Bid Due Date and will also be emailed with the Post-Bid Interview invite.
    A. The bid breakdown information is used to evaluate bids for completeness and helps the Granger estimating department to confirm quantities and unit pricing.
    B. This information is not considered a SOV and if your company is awarded this scope of work, you will have an opportunity to make changes prior to finalizing.
    C. You may modify the excel file as needed as long as you are providing an equal level of detail.

REFER TO SCOPES OF WORK DESCRIPTIONS PROVIDED IN APPENDIX B – SCOPES OF WORK

END OF SECTION

SECTION 00 3132

INFORMATION AVAILABLE TO BIDDERS

1. APPENDICES TO THESE SPECIFICATIONS BY REFERENCE HEREUNDER
   A. TMP DRAWINGS & SPECIFICATIONS
   B. GRANGER CONSTRUCTION SCOPES OF WORK (APPENDIX B)
   C. PROJECT SCHEDULE (MILESTONE SCHEDULE INCLUDED IN INSTRUCTIONS TO BIDDERS)
   D. SITE LOGISTICS PLAN
   E. GRANGER CONSRUCTION SAFETY & HEALTH PROGRAM MANUAL
   F. GRANGER CONSTRUCTION SUBCONTRACT AGREEMENT
   G. GRANGER CONSTRUCTION PURCHASE ORDER AGREEMENT
   H. PREVAILING WAGE RATES - VIEW STATE OF MICHIGAN WEBSITE FOR INFORMATION
   I. GEOTECHNICAL INVESTIGATION (SEE BELOW)
   J. GRANGER CONSTRUCTION BILLING AND INSURANCE LETTER TO SUBCONTRACTORS (2 attachments)
   K. BID PACKAGE #2: PRE-ENGINEERED METAL BUILDING BID DOCUMENTS (subcontract awarded to Fedak Corporation/CECO)
   L. TMP SUBSTITUTION REQUEST FORM

2. Geo-technical investigations have been conducted at the site. The Owner is furnishing a report regarding conditions in the area where work is to be performed under the Contract. Such investigations were made for the purpose of study and design.
   A. Bidder, and those Sub-bidders affected by site conditions shall be fully responsible for reviewing the geo-technical investigation report and for any conclusions made on the basis of the information contained therein.
   B. If the water table is shown to be located at a level that could interfere with construction, provide means to remove or divert the water without harming other construction or property as part of the base bid amount. Refer to the work category descriptions for specific de-watering requirements, if any.
   C. The Geo-technical investigation report is furnished only for information and as a convenience to the Bidders. It is expressly understood, and agreed, that the Architect and Owner assume no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations. There is no warranty or guaranty, either expressed or implied, that the conditions indicated by such investigations, or records thereof, are representative of all conditions throughout the site. Nor are such investigations an indication that unforeseen conditions will not be encountered, or that materials other than, or in proportions different from those indicated, will not be encountered.
   D. It is the responsibility of the Bidder and any sub-bidders to make additional geo-technical investigations if, after reviewing the geo-technical investigation report and from deductions or conclusions made thereof, further data is required to determine site conditions and to properly

provide for required construction. Such additional investigations shall be at no additional cost to Owner and shall be undertaken only upon Owner's written authorization.

E. Bidder and sub-bidders shall provide insurance protecting and holding Owner and Architect harmless from claims arising from this additional investigation work due to bodily injury, including death, and due to property damage to Owner's or other's property.
F. A report of geo-technical investigations prepared by G2 Consulting Group dated is included following this section.

These appendices are incorporated by reference only and are available in BuildingConnected Files. Bidders acknowledge that they understand these appendices may have financial impact on their proposal and they assume responsibility for that potential cost impact.

END OF SECTION

00 5100

CONTRACT AGREEMENT

1. Granger Construction's Subcontract Agreement between Construction Manager and Subcontractor is hereby made part of these Specifications.
2. This document will be used with no exceptions. A copy is provided as an appendix on the project bidding site for reference.

END OF SECTION

00 6216

INSURANCE CERTIFICATES

1. Certificates of insurance are to include the following coverages:

GENERAL LIABILITY INSURANCE

Occurrence box must be checked		
General Aggregate	OR	$ 2,000,000
General Aggregate + Umbrella		$ 3,000,000
Products – Comp/Op Aggregate	OR	$ 2,000,000
Products – Comp/Op Aggregate + Umbrella		$ 3,000,000
Personal & Adv. Injuries	OR	$ 1,000,000
Personal & Adv. Injuries + Umbrella		$ 2,000,000
Each Occurrence	OR	$ 1,000,000
Each Occurrence + Umbrella		$ 2,000,000

AUTOMOBILE LIABILITY INSURANCE

Combined Single Limit	OR	$ 1,000,000
Combined Single Limit + Umbrella		$ 2,000,000

OR

Bodily Injury (per person)	$ 1,000,000
Bodily Injury (per accident) or Property Damage (per accident)	$ 1,000,000
Bodily Injury (per person) + Umbrella	$ 2,000,000
Bodily Injury (per accident) + Umbrella	$ 2,000,000
Property Damage + Umbrella	$ 2,000,000

EXCESS LIABILITY INSURANCE

Umbrella	$ 1,000,000

WORKERS COMPENSATION AND EMPLOYERS LIABILITY

Statutory Limits box must be checked		
Each Accident (Employers Liability)	OR	$ 500,000
Each Accident + Umbrella		$ 1,500,000
Disease – Policy Limit (Employers Liability)	OR	$ 500,000
Disease – Policy Limit + Umbrella		$ 1,500,000
Disease – Each Employee (Employers Liability)	OR	$ 500,000
Disease – Each Employee + Umbrella		$ 1,500,000

PROFESSIONAL LIABILITY INSURANCE (required for all Professional Service Vendors)

Each Claim	$ 1,000,000
Aggregate	$ 1,000,000

2. All liability insurance policies shall name Granger Construction Company, Dexter Community Schools and TMP Architecture as additional insured parties and shall be non-contributory and primary coverage for the additional insureds. The form used for additional insured coverage shall be on form CG 2010, 1985 edition, or equivalent, and shall not exclude products/completed operations hazard coverage. The completed operations coverage shall be kept in effect for 3 years following completion of the Subcontractor's work. Note: G17957B is not acceptable.
3. Notice of Cancellation or Change is required a minimum of 30 days prior and must be listed on the Certificate of Insurance.
4. Builder's Risk Policy provided by Dexter Community Schools. Per occurrence deductible is $5,000.00. Copy of policy is available upon formal request.

END OF SECTION

00 7200

GENERAL CONDITIONS

1. Pursuant to the Subcontract Agreement, the contract between Construction Manager and Owner together with all the General, special, and other conditions, and any general requirements thereof are incorporated and made part of these specifications.
2. A copy of this agreement will be made available post contract award or upon request.

END OF SECTION

01 1100

SUMMARY OF WORK

1.1 SECTION INCLUDES

1. Project Description
2. Future Work
3. Work by Owner
4. Subcontractor use of premises
5. Administrative Responsibilities
6. Owner furnished products
7. Permits, Fees & Notices
8. Contractor Construction Sequence

1.2 RELATED DOCUMENTS

1. Drawings and Division 0 General Conditions and other Division 1 Specification Sections, apply to Work of this section.

1.3 PROJECT DESCRIPTION

1. The intent of this Section is to indicate the Work required by the Subcontractor and to provide information regarding the duties, responsibilities, and cooperation required by the Subcontractor, with similar requirements for their subcontractors and suppliers.
2. The Project is defined to include the Bid Categories described in Appendix B – Scopes of Work and each is recognized to be a major part of the project, with Work to be performed concurrently and in close coordination with Work of other Bid Categories.
3. Related sections:
   A. Some sections of the technical specifications (Divisions 1 through 33) may include a paragraph titled "Related Sections". This paragraph is an aid to the Project Manual and is not intended to include all sections which may be related. It is Subcontractor's obligation to coordinate all sections whether indicated under "Related Sections" or not.

1.4 FUTURE WORK

1. Future Contracts for completion of the Project will be awarded and coordination of work will be required between successful bidders of this bid package & successful bidders of future bid packages.

1.5 WORK BY OWNER

1. Work by Owner is work that the Owner will contract for separately; design, drawings, specifications, and work will be by others per separate contract. The following will be work by Owner:
   A. As indicated on drawings or specifically described elsewhere in this Project Manual.

1.6 OWNER FURNISHED PRODUCTS

1. Products furnished to the site and paid for by Owner:
   A. Owner furnished products are indicated on the drawings.
2. Owner's Responsibilities:
   A. Arrange and pay for product delivery to site.
   B. On delivery, inspect products jointly with Construction Manager and Subcontractor.
   C. Submit claims for transportation damage and replace damaged, defective, or deficient items.
3. Subcontractor's Responsibilities:
   A. Receive, schedule for delivery and unload products at site; inspect for quantity, completeness and damage, jointly with Owner and Construction Manager.
   B. Handle, store, install and protect finish products.
   C. Repair or replace items damaged until substantial completion.

1.7 USE OF PREMISES, BARRICADES, AND PROTECTION

1. Subcontractors and their Subcontractors shall be subject to such rules and regulations for the conduct of the work as the Owner or Construction Manager may establish. Employees shall be properly and completely clothed while working. Bare torsos, legs, and feet will not be allowed. Subcontractors and their subcontractors shall recognize that use of vulgar or profane language is cause for immediate dismissal. Drugs, alcohol or other offensive materials or firearms are absolutely prohibited, and violations are cause for summary dismissal and/or criminal prosecution.
2. Subcontractors shall maintain free access to buildings and areas of the site for designated vehicles, service vehicles, and firefighting equipment and at no time shall block off or close roadways or fire lanes without providing auxiliary roadways and means of entrance acceptable to the Owner. Fire hydrants must remain accessible. Subcontractors shall give the Construction Manager, Owner and the local fire department at least 48 hours notice of any such changes of routes.
3. Subcontractors shall not load or permit any part of a structure to be loaded with a weight that will endanger its safety or cause damage to the components of the structure.
4. The Owner or Construction Manager shall have the option to curtail or delay activities that affect their operations. Should a Subcontractor be asked to stop their work the Subcontractor shall do so immediately and proceed with other activities with no additional cost to the Owner or Construction Manager. Subcontractors are to cooperate with the Owner's representative and Construction Manager in construction operations to minimize conflict, and to facilitate Owner usage.

1.8 ADMINISTRATIVE RESPONSIBILITIES OF SUBCONTRACTORS AND CONSTRUCTION MANAGER

1. The Construction Manager shall be responsible for the maintenance of the Construction Schedule and the general supervision of every phase of the Work.
2. Subcontractors shall cooperate with and assist the Construction Manager in the preparation of construction progress and procedures, schedule of product deliveries, and their effect on the overall project progress and completion

1.9 PERMITS, FEES, AND NOTICES

1. The Construction Manager will secure the general building permit for the Owner. Each Subcontractor shall secure and pay for other permits, governmental fees, and licenses necessary for the proper execution and completion of their Work, which are applicable at the time the bids are received. Fees to relocate utilities on Owner's property shall be included in the bid of the Subcontractor doing the relocation.
2. Utility Tie-Ins: Shall be arranged with local utility company and other involved parties for minimum interruption of service.
3. Shutdowns of existing systems shall be limited to minimum time required and scheduled with other involved parties. Provide two days written notice of shutdown to Construction Manager and Owner.
4. Inspections of installed work shall be performed by the governing authority as arranged for by the Subcontractor. Work shall not be covered until approved.
5. Subcontractor to provide a copy of all permits to CM.

1.10 CONTRACTOR CONSTRUCTION SEQUENCE

1. Refer to Project Schedule located in Appendix C – Project Schedule.

REMINDER: Refer to Appendix B for Scope of Work Descriptions

END OF SECTION

01 2000

PRICE AND PAYMENT PROCEDURES

1.1. SECTION INCLUDES

1. Schedule of Values
2. Applications for Payment
3. Change Procedures
4. Contested Work

1.2. RELATED SECTIONS

1. General Conditions (by reference)
2. Section 01 3300 – Submittals
3. Section 01 6000 – Product Requirements

1.3. SCHEDULE OF VALUES

1. Submit typed schedule on AIA Form G703 -Application and Certificate for Payment Continuation Sheet.
2. Submit Schedule of Values within 7 days after Construction Manager Subcontractor Agreement or Letter of Intent is received (whichever occurs first).
3. The Schedule of Values must be approved by the Construction Manager prior to issuance and acceptance of the Subcontractor's first Application for Payment. Provide detail and/or additional breakdown as required by Construction Manager. Submit evidence to substantiate proposed Schedule of Values upon request.
4. Revise schedule to list approved Change Orders, with each Application for Payment.
5. Retainage in the amount of **10** will be withheld from all progress payments.

1.4. APPLICATIONS FOR PAYMENT

1. Submit one (1) copy of each application. The original Application must be submitted on or before the 25th day of each month. Computer generated facsimiles of standard forms are acceptable if they are of like content and size, subject to the Construction Manager's approval.
2. No application will be processed until the Schedule of Values is submitted and approved.
3. Review of proposed invoice shall be done at the site in person or email "pencil" before the 20th of the month. No application will be processed until the pencil copy is approved.
   A. Percentage completion of a line item will be the percent complete projected through the end of the month.
   B. Obtain approval from the Construction Manager prior to purchasing material for early payment of stored material.
      i. Material must be incorporated in the final work.
      ii. Multiple unit items must be inventoried each month.
      iii. One (1) copy of the invoice from the supplier must be submitted.

iv. One (1) copy of the executed "Materials Stored Payment Form," along with Construction Manager required proof of title and insurance, must be submitted.

C. Material stored off site will not receive consideration for payment until the Construction Manager receives and approves complete documentation of legal title, insurance, material supply bond, and property security.

D. Stored Material Payment is intended to be used for major items only and only with advance approval by the Construction Manager. Significant savings to the owner may be required to obtain this approval.

E. Stored Material Payment will not be considered for commonly available items.

4. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
5. Waiver of Lien: With each application, submit sworn statements and waivers of lien from every entity who may file a lien arising out of the contract, and related to work covered by the payment.
   A. Submit final Application for Payment with final waivers from every entity involved with performance of Work covered by the application who could be entitled to a lien.
   B. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.

1.5. CHANGE PROCEDURES

1. The Construction Manager may issue a Bulletin which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Subcontractor will prepare and submit an estimate within fourteen (14) days. Failure to submit such a written claim within fourteen (14) days may be interpreted as the Subcontractors full acceptance of the Proposed change at a cost or credit to the Owner as determined by the Architect and Construction Manager.
2. The Subcontractor may propose changes by submitting a request for change to the Construction Manager, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other Subcontractors. Document any requested substitutions in accordance with Section 01 6000. The Construction Manager may stipulate which Change Order method shown below shall be used to adjust the Contract.
3. Stipulated Sum Change Order: Based on Bulletin and Subcontractor's fixed price quotation or Subcontractor's request for a Change Order as approved by Construction Manager.
4. Unit Price Change Order: For pre determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre determined, execute Work under a Field Order. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
5. Cost Change Directive (CCD)/Field Order (FO): Construction Manager may issue a directive, signed by the Owner, instructing the Subcontractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of

determining any change in Contract Sum/Price or Contract Time. Promptly execute the change. Payment will be made after CCD/FO is incorporated into the work by execution of a change order.

6. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Construction Manager will determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work. A cost breakdown of all wages, material and vendor invoices must be submitted with all extra work. Only that labor expended on the site shall be reimbursable. Management, estimating, expediting, trucking, warehousing and small tools shall be viewed as an overhead item.
7. Execution of Change Orders: Construction Manager will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.6. CONTESTED WORK

1. Refer to Article 24 of the CM/Subcontractor Agreement.

END OF SECTION

01 3000

ADMINISTRATIVE REQUIREMENTS

1.1. SECTION INCLUDES

1. Coordination
2. Protection and Restoration
3. Field Engineering
4. Safety
5. No Smoking/Tobacco Rule
6. Pre-Bid and Site Inspection Meeting
7. Post Bid Meeting
8. Pre-Construction/Kick-off Meeting
9. Progress Meetings

1.2. RELATED SECTIONS

1. Section 01 3216 – Work Sequence Milestone Schedule
2. Section 01 7000 – Execution Requirements

1.3. COORDINATION

1. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
2. Each Subcontractor shall see that sleeves and inserts are kept in their proper positions and not displaced by the placing of concrete or other construction work. Locations of chases are indicated in the Drawings. The separate Subcontractor and sub-Subcontractor of the Work involved shall be responsible for inclusion of these items in the Work and shall advise each other and CM of required changes.
3. Each Subcontractor shall recognize the complex nature of the Project, such as the bid package, bid category(ies), the sequential nature of contracts, and the concurrent operations of other Subcontractors with the Work under this Project. Subcontractors are required to review, discuss, and coordinate their work with the work of other Subcontractors as well as through the CM with regard to sequence, compatibility of materials and sizes and required clearances prior to beginning the work to avoid construction delays which impact the Owner's occupancy of the facility.
4. Each Subcontractor shall become thoroughly familiar with the requirements of Division 1, the Schedule, project milestones, and scope of work of other Subcontractors and make adjustments necessary to maintain the project master Construction Schedule, as well as the schedules of their Subcontractors.
5. The completion of the building(s) within the prescribed time is dependent upon the close and active cooperation and open discussions of those involved; therefore, it is expressly understood and agreed that each Subcontractor shall layout and install their work at such time and in such manner as not to

delay or interfere with the carrying forward of the Work of other Subcontractors. Observation of the work by others shall not be interpreted as relieving a Subcontractor from their responsibility for coordination, superintendence, or scheduling and direction of the Work.

6. The Subcontractors are to report interferences, discrepancies, or incompatibilities discovered to the Construction Manager whose decision as to the party or parties at fault and as to the manner in which the matter may be resolved, shall be binding and conclusive on all parties. The Construction Manager may direct layout/location changes as required to make the entire work fit together. Minor changes of this nature will not be considered for increase in contract amount. Failure of a Subcontractor to notify other Subcontractors and the CM of a potential interference, incompatibility, or discrepancy and failure to coordinate their work with that of other Subcontractors prior to installation or fabrication may be considered as sufficient cause to deny consideration for additional payment for what otherwise may be considered a change.
7. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair. Make adequate provisions to accommodate items scheduled for later installation.
8. Coordination and Layout Drawings:
   A. Prepare and maintain Coordination and Layout Drawings.
   B. Prepare the Coordination and Layout Drawings on a reproducible medium. Drawing size shall be uniform for each set prepared. Size of drawing shall match the size of the Contract Drawings. Coordination and Layout Drawings are special types of drawings prepared by the Subcontractor, prior to fabrication and installation, for its use, that show the relationship and integration of different construction elements that require careful coordination during fabrication and/or installation to have a maximum utilization of space for efficient installation of the different components or for the proper function as intended. Primary emphasis for this coordination is for work Divisions 21 through 26.
   C. Show the interrelationship of components that were shown on separate Shop Drawing submittals.
   D. Coordination and Layout Drawings shall be drawn to scale showing the intended method of installation and construction. Use Contract Drawings and Specifications, which are schematic representations of the Architect's design intent, as a guide in preparing the Drawings. The Drawings shall not be a repetition or direct copy of the Contract Drawings. The Drawings shall reflect the full intent of the Architect's Contract Drawings. Type, quantity, and location of equipment shall not be compromised. During preparation of the Drawings for any item of work or trade, coordinate with Drawings of all other work or trades involved in the Project.
   E. Indicate required installation sequences.
   F. Keep a current set of Coordination and Layout Drawing prints on site and protect them from deterioration and loss.
   G. Provide the Construction Manager access to the Drawings for reference during normal working hours.
   H. Maintain and file in a chronological and numerical order.
   I. Post changes and modifications as they occur.

J. Use final Coordination and Layout Drawings in preparing "Record Drawings" as called for in Section "Project Close-Out".

9. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owners partial occupancy.
10. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4. PROTECTION & RESTORATION:

1. Section Includes:
   A. This section includes, but is not necessarily limited to, responsibilities for the protection, restoration and notification requirements for surface and subsurface structures, underground facilities and surface improvements as indicated on the drawings, as specified herein and as necessary for the proper and complete performance of the work.
2. Subcontractor whose operations necessitate notifications, protection, or restoration shall be responsible for the work described in this section inclusive of all coordination and cost.
3. Related Sections:
   A. Documents affecting work of this section include, but are not necessarily limited to; General Conditions and sections in Division 1 of these specifications.
4. Prior to start of construction responsible Subcontractor shall:
   A. Notify MISS DIG in advance.
   B. Arrange for the identification of the locations of existing underground facilities at or contiguous to the site.
5. Utility Interruptions:
   A. For any period exceeding 2 hours: Provide standby utility service.
   B. Provide 48 hours notice to the affected occupants of the time and duration of the anticipated shut off.
   C. Notify Fire Department in advance if water main or fire supply line shut off is required.
   D. Pay all costs relating to utility interruptions.
6. Be responsible for:
   A. Protection of structures and utilities at or contiguous to the site in accordance with the project General Conditions
   B. Cost of cleaning, repair, relocation, raising, lowering, or replacement of structures and utilities which interfere with new work or are damaged as a result of Subcontractor's operations.
   C. Temporary sheeting, bracing, poles, cables, sand fill or other means used to support a structure or utility exposed or endangered by Subcontractor's operations.
   D. Relocating, raising or lowering of a structure or utility for Subcontractor's convenience.
7. Relocation of poles and structures:
   A. Be responsible for temporary and permanent relocation of power, light, telephone and other service poles and appurtenant structures.
   B. Make necessary arrangements with the owner of the pole or structure and pay all costs involved.
8. Acceptable standards for restoration:

A. Restore to the better of:
   i. Original condition
   ii. Requirements of the Contract Documents
   iii. Current MDOT or ODOT Standards

9. Property corners, Government survey corners, and plat monuments:
   A. Protect from damage or disturbance:
   B. Protect discovered points until Engineer or Owner has witnessed or otherwise referenced their locations.
   C. Replace if disturbed or removed as a result of construction:
      i. Arrange for replacement by a Registered Land Surveyor
      ii. Pay all costs
10. Driving surfaces and similar improvements:
   A. Repair or replace damaged or removed surfaces as indicated on the drawings and specified herein.
   B. Adjust to temporary or final grade all new and existing castings (water valve boxes, manholes, catch basins and similar structures) for all gravel, bituminous or concrete surfacing or resurfacing.
11. Landscaping and miscellaneous improvements:
   A. Protect from damage by construction operations. In event of damaged, replace any damaged items with one of equivalent type and size.
   B. Includes, but is not limited to, topsoil, seeded areas, sodded areas, shrubs, trees, decorative plantings, fences, mailboxes, signs, guard posts and other similar items.

1.5. FIELD ENGINEERING:

1. Section Includes
   A. Owner furnished survey
   B. Project Record Documents
   C. Examination
   D. Survey Reference Points
   E. Survey Requirements
2. Related Sections
   A. Section 01 7000 – Execution Requirements: Project Record Documents
3. Owner Furnished Survey – If applicable
   A. The Owner may have conducted topographic survey and boundary survey used for site design and engineering. If completed, this survey information is shown on the construction documents for establishment of building control lines and benchmarks as shown on construction documents.
   B. Subcontractors will, at their own expense, be responsible for all field engineering lines and elevations required for the complete execution of their work.
4. Examination
   A. Verify locations of survey control points prior to starting work.
   B. Promptly notify Construction Manager of any discrepancies discovered.

5. Survey Reference Points
   A. Subcontractor to locate and protect survey control and reference points.
   B. Control datum for survey is that indicated on drawings.
   C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
   D. Promptly report to Construction Manager the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
   E. Replace at your own expense dislocated survey control points based on original survey control. Make no changes without prior written notice to Construction Manager.
6. Survey Requirements
   A. Each Subcontractor shall provide field engineering services at their own expense. Utilize recognized engineering survey practices.
7. Establish elevations, lines and levels. Locate and lay out all work by instrumentation and similar appropriate means:
   A. Periodically verify layouts by same means.

1.6. SAFETY:

1. The following safety requirements do not, in any way, relieve the Subcontractor or their employees, agents, or subcontractors of any safety responsibility. It does not relieve the Subcontractor of liability for negligence which would apply in the absence of this material. The Subcontractor shall assure compliance of their subcontractors or agents to site, Federal, State and Local regulations. A Subcontractor shall at all times use good judgment and discretion about safety.
2. The following safety information is supplementary to both the information contained in the General Conditions and Granger Construction Safety & Health Manual and does not intend to take precedence over same. See Section 00 2113 Instructions to Bidders and Section 00 3132 Information Available to Bidders for additional information relating to Granger Construction Safety& Health Manual.
3. The Subcontractors and Subcontractor supervision unable or unwilling to secure safe performance by their employees are not acceptable. Unacceptable persons shall be removed from the Project at the request of the Project Manager.
4. Subcontractors and their subcontractor employees, who exhibit a poor attitude toward safe work practices or procedures will be removed and replaced by the Subcontractor at the request of the Project Manager.
5. The requirements of the Occupational Safety and Health Act (OSHA) and/or Michigan Occupational Safety and Health Act (MIOSHA), will be adhered to or the Subcontractor will furnish the Project Manager with a written variance from OSHA/MIOSHA authority.
6. The Subcontractor's employees and all employees of the Subcontractor's subcontractors and agents performing work at the project site shall attend weekly Tool Box Talk safety meetings, as required by the Granger Construction Safety & Health Manual.
7. The Subcontractor shall:

A. Promote safe working performance on the part of their employees. Each Subcontractor will conduct safety programs tailored to their own particular needs.
B. Be responsible for recording and reporting injuries and illnesses in accordance with OSHA rules and regulations.
C. Inform all employees of the location and use of fire extinguisher, rescue equipment, first aid equipment, etc.
D. Provide in each trailer window, a legible printed sign listing emergency telephone numbers, including local public fire and police departments, ambulance services and other emergency numbers as well as the address of the worksite.
E. Inspect their working areas to detect and correct hazardous conditions and unsafe working procedures.
F. Notify the Project Manager immediately of an accident.
G. Immediately report any property loss accidents to the Project Manager.
H. In the event of an on-site emergency, immediately account for all employees and report to the Project Manager.
I. Submit a written investigative report to the Project Manager within 24 hours following an accident which results in employee fatality or injuries requiring hospitalization.
J. Designate an On-site Safety Representative in writing to the Project Manager.
K. Provide two 24 hour emergency phone numbers to the Project Manager.\
L. Administering First Aid:Adequate first aid equipment, supplies and facilities are the responsibility of each Subcontractor for their personnel. A first aid log book shall be maintained which documents every first aid case. When first aid must be administered, a description of the accident shall be entered in the Subcontractor's daily report which shall contain the following information**:**
    i. Date of injury. Indicate with an asterisk (*) if the date of injury is different than the time of treatment.
    ii. Time of injury.
    iii. Name and discipline/craft of injured employee.
    iv. Description of the accident including narration of the event.
    v. Type of injury (burn, cut, bruise, etc.)
    vi. Part of body injured (lower back, left knee, etc.)
    vii. When first aid is given for non-job related symptoms (aspirin for headache, bandaids, etc.), the treated employee shall initial the "description" part of the log. A full account is not necessary.

8. Medical Attention:

A responsible party shall determine whether the care of a physician is necessary and proceed. If medical care appears necessary, but perhaps not urgent, do not wait until the end of a shift to obtain treatment. Immediate medical attention should be given to help ascertain and prevent health hazards. A "wait and see" attitude will do little to help specify hazards in specific areas (such as carbon monoxide or chemical exposure).

1.7. NON-SMOKING/TOBACCO RULE

1. No smoking, or tobacco products, will be allowed on project site after building enclosure or as governed by governing authorities and/or Owner requirements. There are no exceptions to this rule. Any worker found smoking can be permanently removed from the project at the sole discretion of the Construction Manager.

1.9. POST BID MEETING

1. Post Bid Meeting will be conducted with the apparent successful bidders to review specification compliance, scope of work, schedule and Subcontractor capabilities. This meeting may be waived at the discretion of the Owner and/or Construction Manager. The Post Bid Meeting notes will become a part of the contract documents executed resulting from this meeting.

1.10. PRE-CONSTRUCTION/KICK-OFF MEETING

1. Construction Manager will schedule a conference at the Project site prior to Subcontractor occupancy.
2. Attendance Required: Construction Manager, Subcontractor, and major Sub-Subcontractors and all of their superintendents/foremen proposed for use on this project.
3. Agenda:
   A. Use of premises by Owner and Subcontractor.
   B. Construction facilities and controls provided by Owner.
   C. Temporary utilities provided by Owner.
   D. Review of contract limits and building layout.
   E. Security, safety and housekeeping procedures.
   F. Schedule review and planning of overall Project.

1.11. PROGRESS MEETINGS

1. Construction Manager will schedule and administer meetings throughout progress of the Work at weekly intervals (or as frequently as the Construction Manager deems necessary).
2. Construction Manager will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies to Architect/Engineer, Owner, participants, and those affected by decisions made.
3. Attendance Required: Job superintendent, major Subcontractors and suppliers as required for coordination of work, Owner, Architect/Engineer, and others as appropriate to agenda topics for each meeting. The Subcontractor's Project Manager may be required to attend Progress Meetings at the discretion of the Construction Manager.
4. Agenda:
   A. As defined by the Construction Manager.

END OF SECTION

This Section Includes:

1. Bid Categories that are required to participate in BIM coordination
2. Introduction
3. 3D BIM – Software Requirements
4. Communication & File Exchange
5. Collaborative Coordination Review Meeting Process
6. Phase Construction Validation Reporting Requirements
7. Kick-off Meeting Information
8. BIM Level of Detail for Construction Coordination Phases
9. BIM Process Expectations
10. Sign-off Process
11. As-built Process & Document Requirements
12. Install / Shop Drawings Procedure
13. Damages Caused by Failure to Meet Deadlines and Deliverables
14. Miscellaneous Requirements

1. Bid Categories that are required to participate in BIM coordination.

Trade contractors are required to field verify existing conditions and connections as required for accurate modeling of their scope. Trade Contractors are responsible for elevating the detail of the design model to the highest level of detail required to complete their modeling and coordination scope.

- **03 – Building Concrete, 03 – Precast Concrete, 04 – Masonry, 05 – Structural & Misc. Steel, 06 – General Trades, 06 – Casework, 08 – Glass & Glazing, 09 – Drywall & Acoustical Ceilings, 09 – Painting, 09 – Resilient Flooring, 09 – Hard Tile, 22 – Plumbing, 23 – Mechanical, 26 – Electrical, 31 – Earthwork & Site Utilities, 32 – Site Concrete, 32 – Asphalt Paving, 32 – Landscaping**

2. Introduction

The goals of the Construction Manager in implementing this BIM plan include, but are not limited to, the following:

A. Provide coordinated workflow between architectural, structural, MEP, and any specialty trades.
B. Utilize a federated 3D model to determine a safe and efficient construction plan for all elements of the project.
C. Improve construction and design team collaboration
D. Minimize conflicts/clashes in the field.
E. Allow for off-site fabrication of as many components and systems as it is practical.
F. Provide an accurate as-built model.

G. The building plans from the Architect were created in Revit and will be the starting point of the model.

Per this BIM implementation plan, a VDC Lead will be provided by Granger Construction. The VDC Lead will receive models from all required Trade Contractors, develop clash reports, schedule, and facilitate resolution of all coordination issues. All project team members will be required to participate in every meeting scheduled by the VDC Lead.

Coordination Team Members - Per this BIM implementation plan, trade contractors required by their respective bid category or scope of work, will be required to take part in a collaborative 3D coordination process prior to any field installation activities. Subcontractors Foreman, PM, and Detailer will be in the weekly meetings, either on-site or virtual. Taking part in this collaborative coordination process will include but not be limited to; maintaining current and updated model files as required for taking part in the 3D coordination process, attending weekly coordination / weekly Foreman BIM meetings / interference detection meetings, maintaining continuous understanding of the progress made throughout the coordination process, addressing any open items communicated by the VDC Lead, correction of all applicable coordination / interference issues reported on a weekly basis by the VDC Lead, back-check the individual scope of work to ensure that all reported and communicated coordination / interference items throughout the collaborative coordination process have been addressed, and participate in the collaborative coordination team members design validation and cost avoidance reporting requirements.

TRADES REQUIRED FOR COORDINATION

1. **The following Trades must provide a 3D coordination model for their respective work and attend coordination meetings as noted below:**

Trade	Trade ID	Provide 3D Model	Attend Coordination Meetings	
			All Meetings	As Required
Precast	PC	X		X
Structural Steel	ST	X		X
Joist	JOI	X		X
Pefab Metal/Wood Panels (Interior/Exterior)	PF	X		X
Plumbing	PL	X	X	
Sheet Metal	SM	X	X	
Mechanical Piping	MP	X	X	
Fire Protection	FP	X	X	
Electrical	EL	X	X	
Specialty Sub	SS	X		X
Fire Alarm	FA	X		X
Security Electronics	SE	X		X
Food Services	FS	X		X
Medical Equipment	ME	X		X

Medical Support Structure	MES	X	X	
Technology	IT	X		X
Civil	CV	X		X
Design Team	DA	X		X

2. **Subcontractors using 3rd party 3D Detailers/Modelers (meaning they are not in-house for BIM Coordination is still responsible for the following:**
   A. Participation during BIM Coordination Meetings.
   B. Writing and Submitting RFIs.
   C. Providing a fully coordinated model in adherence to the BIM Coordination Schedule.
   D. Granger shall not be responsible for any charges, fees, or overages from the 3rd party consultant. This responsibility falls directly on the subcontractor who hired the 3rd party.
   E. Two subcontractors cannot use the same 3rd party on the same project without CM approval.
   F. Foreman will be responsible for reviewing install drawings and signing off on BIM Coordination.

3. **3D BIM – Software Requirements**

Coordination Team Members: All coordination team members will be required to use 3D BIM-capable software for the coordination process associated with this project. Software utilized will need to be capable of providing the file type required by the VDC Lead to construct the working federated model. Such software includes but is not limited to the latest versions of Revit, AutoCAD and AutoCAD MEP. Coordination team members will be required to have an Autodesk Construction Cloud (ACC) (Minimum Collaborate or Collaborate Pro, etc.) license as all models will be stored on Granger's Autodesk Construction Cloud. Coordination team members will also be required to have a license for Autodesk Navisworks Manage to review clashes. The subcontractor's native/live files will be hosted on the project's ACC site. All teams will link files from that location.

4. **Communication & File Exchange**
   A. BIM and CAD required files for coordination purposes are to include logically separated files per contractor, phase, and building level.
   B. It will be required that all files be stored on a server with an active backup system by each individual trade contractor acting as a coordination team member. Disaster recovery plans will be required from each of the coordination team members stating how often back-ups are to be conducted and a detailed approach to retrieving data stored off-site should also be discussed and provided.
   C. All coordination team members taking part in this BIM process will be required to utilize the Granger's construction cloud collaboration system for communicating all project coordination file updates. This site will be accessible to coordination team members and contain a specific location where each trade contractor can upload their current progress files. Unless otherwise determined by the coordination team after trade contract awards, the current upload schedule for such periodic progress files will take place weekly and/or daily as determined by the VDC Lead.

D. Email – Subject line of all emails should be prefaced with the Project Name. Emails shall NOT mix subjects. “Replies” to emails should relate only to the initial topic, do not mix subjects.
E. RFI – Any RFI that is developed related to the BIM Process be submitted with “BIM” in the title for tracking purposes. RFI’s will run through projects Procore site.

5. **Collaborative Coordination Review Meeting Process**
   A. Weekly review meetings between all required team members will be conducted by the VDC Lead onsite in the Construction Manager’s field office or in a virtual environment. These review meetings will be held weekly and attendance by every participating coordination team member will be mandatory. It will be required that the trades Foreman, Project Manager, and Detailer attend all meetings. Depending on progress being made and/or demand of the field needs more meetings could be scheduled at the discretion of the BIM Lead. This could include all above parties or just the detailers.
   B. Computers and software required for coordination team members to take part in the BIM process and meeting efforts are to be provided by the trade contractor representing each team member. At various times throughout the coordination process, all team members will be required to work in coordination and communication with all other team members as directed by the VDC Lead. Assume this work may take place in a live working session.
   C. For these coordination meetings, the VDC Lead will combine the required 3D model files, perform clash detection, and issue status reports.
   D. Reports can contain screenshots from Navisworks or applicable software and any expected interference resolutions originating from the review meeting will be provided as part of the report if applicable. The building model and review schedule will be established by the trade contractor’s fabrication sequences that will be required to support the construction field activities of each affected scope of work.
   E. Failure to attend or inadequately prepare for a given meeting will result in the modeling provided for the given meeting by the absent or negligent contractor to be declared “Improperly Coordinated”, requiring the contractor to relocate work as dictated by Granger. No extra compensation will be paid to any contractor for relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all the contractors and the trades involved. If any improperly coordinated work, or work installed that is not in accordance with the approved coordination composites, necessitates additional work by other contractors, the cost of such additional work shall be assessed to the subcontractor responsible as determined by Granger. Errors in coordination will be resolved by the subcontractor at their own expense. Where agreements cannot be reached, Granger will furnish a resolution. The Subcontractor will bear the expense of said resolution.

6. **Phase Construction Validation Reporting Requirements**

During weekly review meetings and as part of the work included to achieve a collaborative coordination process, all trade contractors will be required to carefully study and validate the planned construction process shown within the federated model is the most efficient process possible allowing for optimal

installation while providing for easy and accessible operation of the facility throughout the life cycle of building use. To achieve this outcome, all trades must participate as expert-level coordination team members. During this validation process, any problematic aspects of the design, construction sequence, or schedule should be openly discussed and communicated to the VDC Lead/Granger Project Team to seek input of the architect and engineers and remedied in a timely manner.

7. **Kick-off Meeting Information**

Prior to the BIM coordination process beginning the VDC Lead will conduct a formal kick-off meeting to be attended by all those project participants serving as coordination team members as defined by the individual scopes of work. The point of this meeting will be to develop the final VDC Guide which will further detail the above and below-referenced information and applicable processes that will be followed throughout the course of the collaborative coordination process. A formal agenda for this kick-off meeting will be provided by the VDC Lead and any revisions made to the above and below-referenced BIM Implementation Plan sections will be documented with minutes distributed by the VDC Lead and collaborative coordination team members. The BIM Execution plan will be a living document.

8. **BIM Level of Detail for Construction Coordination Phases**

A. Model files Provided by subcontractor and their supplier/consultants/venders will contain sufficient intelligence to make accurate plans, sections, details, and schedules. Drawings submitted must always be a derivative of the models unless otherwise approved by Granger Construction.
B. All content under subcontractors' contract should be provided as one federated model that itself acquires the project shared coordinates. For example, if a steel contractor models steel in-house but has an external contractor for trusses, that contractor is required to provide those trusses as part of a single model. These trusses should be aligned to the rest of the steel, and the overall model should be aligned to the project shared coordinates.
C. The levels of development for this project will be defined as, but not limited to, the following description.

LOD 350:

A. The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interface with other building systems. Non-graphic information may also be attached to the Model Element.
B. Model to 5/16” tolerance, that is typical field tolerance that could be approved with project team discretion, or if the clash is less than that can be approved. But if it is greater, it will not be approved and will need to be cleared. This is at the discretion of the project team if this approach is taken.
C. All conduit/piping that is ¾” in diameter or larger and/or in runs of 2 or more need to be modeled regardless of size.

AIA Contract Documents Definition:

The Model Element, as designed, is graphically represented within the Model such that its quantity, size, shape, location, orientation, and interfaces with adjacent or dependent Model Elements can be measured.

BIMForum Expansion:

A. LOD 350 is intended to define requirements for model elements that are sufficiently developed to support construction-level coordination. This LOD usually requires craft knowledge, thus the caveat in the LOD 300 interpretation that designers rarely generate elements at LODs higher than 300. It should be remembered, though, that neither the LOD definitions nor this Specification specify who models the element – if a design team has craft knowledge available, they might choose to develop elements to LOD 350 or higher.

B. BIM Models will include Architectural, interior design, structural, mechanical, electrical, plumbing, and fire protection systems as listed below.

C. Architectural BIM model elements have been provided by the design team to meet 350 LOD specification requirements.
   Items to include but not be limited to:
   1. Cold formed metal stud framed walls
   2. Masonry walls and bricks
   3. Meal panel enclosure systems
   4. Interface point of all dis-similar materials.
   5. Windows
   6. Storefront and curtain wall
   7. Doors of all types
   8. Roofs
   9. Ceilings of all types
   10. Louvers
   11. Floors
   12. Casework
   13. Architectural specialties and woodwork
   14. Loading Dock Equipment
   15. Projection Screens
   16. AV equipment
   17. Elevators

Structural BIM Requirements to include, but not necessarily limited to:

A. Foundations
B. Floor slabs
C. Structural steel (to include applied fireproofing)
D. Cast-in-place concrete
E. Expansion / contraction joints
F. Stairs
G. Shafts and pits
H. Steel frames at all roofing penetrations

I. All miscellaneous metals
J. recast strands critical to reinforcement

Mechanical BIM Requirements (¾" and larger 3D model items) to include, but not necessarily be limited to: (Model items to be provided by Trade Contractor).

A. HVAC equipment with code required clearances and Owner maintenance and operability clearances
B. Ductwork with insulation
C. Grilles, registers & diffusers
D. Dampers
E. Mechanical piping with insulation
F. HVAC piping with insulation
G. HVAC piping valves
H. All applicable anchors, hangers, and guides for HVAC, plumbing, and gas systems
I. Plumbing equipment with code required clearances and Owner maintenance and operability clearances
J. All drums clean-outs, plumbing valves
K. Plumbing piping with insulation
L. Vertical circulation elements (shafts, chases, etc.)
M. Elevator equipment
N. Control systems (space allocation representations**)**
O. Natural Gas Systems
P. Access Panels
Q. All items in exposed ceilings of public spaces or offices
R. Dental systems

Electrical / Telecommunications BIM Requirements (¾" and larger 3D model items) to include, but not necessarily be limited to: (Model items to be provided by the Trade Contractor)

A. Interior Power and Lighting (locations of all j-box, power supplies, all electrical elements which may require maintenance and/or inspection etc.)
B. Main electrical distribution equipment (transformers, switchgear, automatic transfer switches, etc.)
C. Lighting fixtures (exact dimensions and needed installation clearance)
D. Special and general-purpose power receptacles
E. Panelboards
F. Special Electrical Systems
G. Fire alarm / mass notification devices
H. Grounding Systems (If applicable)
I. Communications (space allocation representations for cable tray, data racks & maintenance clearances)
J. Security (including space allocation for wire routing and cameras)
K. Wireless access points
L. All equipment clearances per applicable codes and standards

M. AV & IT conduits
N. All items in exposed ceilings of public spaces or offices

Fire Protection BIM Requirements to include, but not necessarily be limited to: (Model items to be provided by the Trade Contractor)

A. All piping, sprinkler heads, fittings & valves
B. Fire department connections
C. Drains
D. Pumps
E. Tanks
F. Sensors
G. Control panels
H. All items in exposed ceilings of public spaces or offices
I. Access Panels

Civil BIM Requirements to include, but not necessarily be limited to:
(Model items to be provided by Trade Contractor. This scope is applicable to all plumbing materials within the building envelope to 5' outside building perimeter by the Plumbing Trade Contractor. Outside this limit is not required.)

A. Storm water
B. Sanitary sewers
C. Utilities
D. Drainage
E. Site Electrical
F. Site low voltage date cable and power

9. **BIM Process Expectations**
   A. All coordination trades will establish general zones for their work. These zones are to be used as guidelines for routing before the coordination meetings.
   B. Subcontractors will prepare models to meet the coordination document requirements and upload models to the project file hosting site on the dates specified in the coordination schedule.
   C. The VDC Manager will create a color coded Navisworks model file for all team members from the files provided on the website.
   D. Any work not represented on the Drawings submitted for coordination will be understood as being routed without impact to the coordinated model. All RFI responses, change orders, or any other design changes are to be included in the model throughout the project.
   E. Upon completion of coordination of a defined area, a final composite model will be created and signed off by all team members.
   F. During the installation of each trade's work, the Construction Manager will refer to the signed composite model to resolve any conflicts. These decisions will be in favor of the agreements made at the coordination meeting.
   G. It is expected that all members of the coordination team have access to Navisworks Manage for self-directed clash detection.

H. Design Team will participate in Coordination Meetings as needed to expedite decision making and facilitate the explanation of Requests for Information.

10. **Sign-off Process**
    A. After each coordination sign-off, each Trade Subcontractor will generate and submit to the VDC Lead (or Granger project team member, or subcontractor Project manager), coordination layout drawings for their work as specified in the Subcontract Documents. The VDC Lead will submit a final sign-off model to the Construction Manager.
    B. Models shall be continually updated to reflect where installations deviate. Revisions will be shared with the VDC Lead as frequently as the deviations occur and as quickly as possible to ensure the project coordination model is current. Any revisions to the installation plan must be given priority over unreleased areas being coordinated to avoid field coordination issues, however, such revisions will not be considered a justifiable cause for delays in the overall coordination process.
    C. A final sign-off model will be generated at the end of the coordination process reflecting all efforts of the VDC team and incorporating and changes or revisions to previously sign-off areas.

11. **As-built Process & Document Requirements**
    A. As-built Process

Throughout the construction installation process, it will be required that all collaborative coordination team members, led by the VDC Lead, maintain all model files in a manner that reflects field revisions made during the installation of on-site materials including change orders.

At the end of the construction field installation process trade contractors involved in the collaborative coordination exercises will be required to submit one (1) digital copy of all model files to the VDC Lead and Granger project team.

At this point in the project, each trade contractor will need to verify that all final model files provided do in fact contain all field revisions made. The VDC Lead will then be responsible for assuring that the files are in fact free of interferences.

Should the VDC Manager find that interferences exist in the as-built files provided by the coordination team members, the appropriate coordination team member will be required to revise and resubmit as-built model files to the VDC Lead as needed until an interference free status is reached.

    B. Document Requirements
        i. The Subcontractor may use an authoring tool that is integrated into their workflow. It must be able to export to NWC file for use in Navisworks for coordination (DWG, DXF, and IFC will also be acceptable, modeled in 3D, and to meet the required coordination parameters).
        ii. File names must follow standard naming convention as described.
        iii. Example: PROJECTID-TRADE-LEVEL-AREA (ie. GCS-EL-01-A)
        iv. Insertion point will be at the Architectural insertion point. (Share Coordinates)

v. Provided coordination files must be "clean" and usable format containing only coordination content to keep the coordination model light. File manipulation will not be performed by the VDC Lead.
vi. All Trade Coordination Drawings should be prepared at a Level Of Development (LOD) 350 at a minimum according the BIM FORUM (www.bimforum.org/lod)

12. **Install and/or Shop Drawing Submittal Procedure**

Once coordination has been determined to be complete signed off for each floor or area of the project, each subcontractor is required to submit for approval such two-dimensional, annotated, as-fabricated drawings as are required to make a complete representation of their entire system scope. These drawings must be fully-dimensioned projections including, but not limited to, plans, sections, and elevations. Unless otherwise stipulated by the project specifications, the drawing scale shall be 1/4" = 1'-0". Printed copies must be delivered to Granger as stipulated by the VDC Lead.

Each Subcontractor shall submit separately all structural penetrations, block outs, cans or cores required for their own work. Granger shall combine these drawings for review by the design team. All penetrations shall be dimensioned from gridline.

Each Subcontractor shall be responsible for incorporating Design or Field Revisions initiated after the sign-off of a given floor or zone into the Federated Model at the sole discretion of the VDC Lead and according to the sequence set forth herein.

13. **Damages Caused by Failure to Meet Deadlines and Deliverables**

A. Each Subcontractor shall be responsible for providing sufficient labor to complete their coordination drawing files according to the established BIM Coordination Schedule
B. Subcontractors are responsible for any and all costs or schedule delays associated with missed model uploads, drawing deliverables, or missed BIM Coordination meetings. Failure to meet deadlines and deliverables will be documented and escalated to senior management accordingly.
C. Subcontractors are responsible for resolving all assigned clashes prior to the next scheduled BIM Coordination meeting. If a clash is unresolvable, the Subcontractor assigned to the clash is responsible for creating and submitting RFI's within 2 days of identifying said conflict. Subcontractor shall be responsible for any schedule or cost impacts associated with delays in resolving assigned clashes. Subcontractor acknowledges and agrees that its delay in taking the steps to resolve clashes and conflicts as set forth in this section will cause Granger Construction to incur damages which are difficult or impossible to determine with precision. Subcontractor therefore agrees that in the event any clash assigned to a Subcontractor goes unresolved or without a submitted RFI for more than one week, Subcontractor shall be liable to Granger Construction for damages at the rate of $0 per day until such clash or conflict is resolved. The parties acknowledge that such damages represent a reasonable estimate of fair compensation

for the losses sustained by Granger Construction as the result of Subcontractor's failure to comply with this section, and that such damages are not a penalty.

END OF SECTION

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PROJECT SCHEDULING

1.1. SECTION INCLUDES

1. Definitions
2. General Requirements for Schedule Submittals
3. Milestone Schedule

1.2. DEFINITIONS

1. Milestone Schedule: This schedule is prepared by the Construction Manager and is included as part of the base bid contract. It will include start and completion dates, as well as any interim dates important to the Owner, such as partial turnovers, etc. It will also include internal milestones, which will be the basis for other Subcontractor's to start their work.
   A. Construction Schedule: This is the schedule developed by each Subcontractor for the work in their own bid package. The initial version of this is submitted to the Construction Manager for incorporation into the Project Schedule.
   B. Project Schedule: This is a compilation of all the Construction Schedules produced by the Subcontractors, and is created by the Construction Manager.
   C. Subcontractor: Company who has a direct contract with the Construction Manager for a singular Work Category, and is responsible to produce a Construction Schedule for their work allowing all the work of the Project to be done.

1.3. GENERAL REQUIREMENTS FOR SCHEDULE SUBMITTALS

A. LEAN: Lean initiatives will be implemented throughout the project to improve reliability, planning, quality, safety, and team performance. Project planning and scheduling will utilize traditional CPM scheduling and the Last Planner production system. This will require attendance by the Project Manager and Foreman at periodic milestone pull planning and phasing meetings. Weekly planning meetings, and onsite daily huddles must be attended by the site foreman.

B. The Construction Manager has prepared a Milestone Schedule. This schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practical execution of the Work as required to meet the Owner's needs.

C. Each Subcontractor shall submit to the Construction Manager their Construction Schedule with complete logic relationships. These must be submitted within 14 days of the issuance of the contract or the notice to proceed. This schedule is preferred to be submitted on computer scheduling software as approved by the Construction Manager. Activities in this schedule shall be as follows:
   i. Generally durations not longer than 45 days.
   ii. Each activity shall be broken down by floor, areas, building, CSI division, or other grouping to allow the above durations.
   iii. Include delivery of major pieces of equipment and materials.

iv. Include detailed plans for owner training and inspections.
v. Each activity shall be resource loaded, which includes manpower and equipment requirements for the Subcontractors Work.

D. The Construction Manager will compile all the Construction Schedules into one overall Project Schedule. In the event that this compilation results in a completion date beyond that of the Milestone Schedule, the following steps will take place:
   i. A scheduling meeting will be held with key individuals from each Subcontractor to resolve the time overage or schedule conflicts.
   ii. The results of the meeting will be incorporated into the Project Schedule and distributed by the Construction Manager. If there is any further disagreement, the Subcontractor must notify the Construction Manager within 5 working days. Adjustment may be made with a timely notice and if in the sole opinion of the Construction Manager that the balance of work can be completed within the Milestone Schedule. After these discussions and changes, the Project Schedule will be deemed acceptable by all Trade Subcontractors. This will be considered as part of the contractual obligations for each Trade Contract.
   iii. Failure to adhere to the Project Schedule may be considered by the Construction Manager to be a partial or complete breach of contract by the Subcontractor, and such breach may result in the Construction Manager using any of the remedies available to them in ARTICLE 19 TERMINATION of the subcontract, for such a breach. Examples of these remedies are:
      (1) Direct that the labor force be increased.
      (2) Direct that overtime be instituted for key activities, including hours beyond the established hours of work, Saturdays, Sundays and Holidays.
      (3) If the above measures do not correct the delay or the Subcontractor does not institute the above, the Construction Manager, may at its discretion and with due notice, take over the work at the expense of the Subcontractor.

E. The Construction Manager shall periodically update the schedule and display same at the jobsite. Each Subcontractor will be responsible to be familiar with the schedule and how it will affect or modify their operations, including their coordination with the activities of other Subcontractors. Each Subcontractor shall cooperate fully in providing detailed schedule input each week at a minimum, at scheduled jobsite progress meetings or at other times as required by the Construction Manager. Commitments made by Subcontractors to updated schedule shall be part of the Contract and incorporated into the Project Schedule.

F. Construction Manager shall select and identify from Project Schedule approximately 10% to 20% of the activities shown for monitoring of timely completion of the work. If any one of those monitored activities are not completed according to the Project Schedule, then any Subcontractor causing the delay shall, upon discovery of likely failure to complete a monitored activity on schedule or upon notice of such likely delay by the Construction Manager, immediately prepare and submit to the Construction Manager, a plan for curing the delay at least before the next scheduled monitored activity is due to be complete. The Construction Manager shall create a revision of the Project Schedule demonstrating the plan for curing the delay.

G. Work Sequence:

i. Start Work immediately upon execution of Contract or upon receipt of Binding Letter of Intent and complete Work in accordance with Contract Documents.
ii. Manage the execution of the Work to meet the referenced schedule, and be responsible for all steps, procedures, and policies necessary thereto. The Construction Manager may advise and suggest ways and means for facilitation of the Work; however, the full responsibility for management of the Work shall remain with the Subcontractor.
iii. Subcontractor agrees that changes in the Project Schedule logic, durations, and dates may be made after start of the project as Construction Manager deems necessary and beneficial to the project. These changes will be accepted by the Subcontractor without claim for additional cost to the Owner or Construction Manager.

1.4. MILESTONE SCHEDULE

A. Please find the Milestone Schedule in Appendix C for this project. This schedule will be the basis for the working Construction Schedule. Subcontractors will review and include provision for completion of all work within the stated timeline.
B. All work areas must be available for occupancy no later than those dates shown for each area.
C. Completion of the Work will be defined as substantial completion per the General Conditions of the contract.

END OF SECTION

01 3300

SUBMITTALS

1.1. SECTION INCLUDES

1. Submittal procedures
2. Construction progress schedules
3. Shop drawings
4. Product data
5. Samples
6. Manufacturers' certificates

1.2. RELATED SECTIONS

1. Section 01 2000 Contract Considerations: Schedule of Values.
2. Section 01 3300 - Progress Schedules.
3. Section 01 7000 Contract Closeout: Contract warranty and closeout submittals.

1.3. SUBMITTAL PROCEDURES

1. Transmit each submittal with AIA Form G810 (or approved equivalent)
   A. General: Package each submittal appropriately for transmittal and handling to the Construction Manager. Transmit each submittal from Subcontractor to Construction Manager using a transmittal form. Submittals received by the Architect which have not been reviewed by the Construction Manager or are from other sources other than the Subcontractor will be returned without action.
   B. Recording Information: On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Subcontractor's certification that information complies with Contract Document requirements.
2. Sequentially number the transmittal forms
3. The following information must be included with each submittal for processing and recording action taken:
   A. Project number (Architect's and Construction Manager's)
   B. Project name
   C. Date
   D. Name and address of Architect: do not include logo
   E. Name and address of Subcontractor
   F. Name and address of Supplier
   G. Name of Manufacturer
   H. Name of drawing preparer - not initials
   I. Submittal Number and title of appropriate Specification Section
   J. Drawing number and detail references, as appropriate

4. Schedule submittals to expedite the Project, and deliver to Construction Manager at business address. Coordinate submission of related items. Allow 10 days for Architect's review of each submittal.
5. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
6. Provide (4"x11") space for Contractor and Architect/Engineer review stamps.
7. Revise and resubmit submittals as required, identify all changes made since previous submittal.
8. Distribute reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule. Prepare the submittal schedule in chronological order. Provide the following information:

1. Scheduled date for each submittal
2. Related Specification Section number
3. Submittal Name & Number
4. Name of subcontractor/supplier and contact information
5. Description of the part of the Work covered
6. Expected delivery of products after approval. Subcontractor is responsible for highlighting long lead items that require expedited approvals to prevent project delays.

1.4. CONSTRUCTION PROGRESS SCHEDULES

1. The Construction Manager will prepare and update the master Construction Schedule. Refer to Section 01 3216 - Construction Schedules.

1.5. SHOP DRAWINGS

1. Submit in electronic form, or as required by the Architect/Engineer or Owner.
2. After review, the electronic file will be returned with Architect's comments for the Subcontractor to distribute in accordance with the procedures above and for record documents described in Section 01 7000 – Execution Requirements.

1.6. PRODUCT DATA

1. Submit electronic file to the Construction Manager.
2. Mark the electronic file to identify applicable products, models, options, and other data specific to the Project. Supplement manufacturers' standard data to provide information unique to this Project.
3. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01 7000 – Execution Requirements.

1.7. SAMPLES

1. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
2. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect/Engineer's selection.
3. Include identification on each sample, with full Project information.
4. Submit the number or samples specified in individual specification Sections; one of which will be retained by Architect/Engineer.

1.8. MANUFACTURER'S CERTIFICATES

1. When specified in individual specification Sections, submit manufacturers' certificate to Architect/Engineer for review, in electronic format.

END OF SECTION

01 4000

QUALITY CONTROL

1.1. SECTION INCLUDES

1. Quality assurance and control of installation
2. Dimensional Responsibility
3. References
4. Inspection and testing laboratory services

1.2. RELATED SECTIONS

1. General and Supplementary Conditions - Article 13.5.1
2. Section 01 3300 Submittals: Submission of Manufacturers' Instructions and Certificates.
3. Section 01 6000 – Product Requirements: Requirements for material and product quality.

1.3. QUALITY ASSURANCE/CONTROL OF INSTALLATION

1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
2. Comply fully with manufacturers' instructions, including each step in sequence. Perform all steps required by manufacturer to properly install the Work regardless of whether every step is called out in this specification.
3. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
4. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
5. Perform work by persons qualified to produce workmanship of specified quality. Subcontractors who utilize unskilled workers to perform skilled trades work will be required to bear the burden of proof and certify in writing that the quality of the work in place, exceeds or equals the specified minimum standard.
6. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
7. Whenever a Subcontractor intends to depart from normal work hours, they shall notify the Construction Manager at least 24 hours in advance for approval. Failure of the Subcontractor to give such timely notice may be cause for the Construction Manager to require the removal or uncovering of the Work performed during such time without the knowledge of the Construction Manager. Special arrangements can be made for emergency work or shutdowns as may be required.

2.1. DIMENSIONAL RESPONSIBILITY

1. Thoroughly examine existing conditions and be familiar with work to be performed as hereinafter specified and as shown on drawings.

2. Before performing work or ordering materials, verify relevant dimensions of existing and new work and be responsible for their occurrence. Any differences found shall be reported to Construction Manager and Architect for consideration before proceeding with work. If Subcontractor inadvertently or knowingly, proceeds with their work on dimensionally inaccurate work of another, they will be liable for cost of all corrections to their work when error is corrected.

2.2. REFERENCES

1. Conform to reference standard by date of issue current on date of Contract Documents.
2. Should specified reference standards conflict with Contract Documents, request clarification for Architect/Engineer before proceeding.
3. The contractual relationship of the parties to the Contract Agreement shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

2.3. INSPECTION AND TESTING LABORATORY SERVICES

1. Owner will appoint, employ, and pay for services of an independent firm to perform inspection, sampling, testing, air monitoring, and certification of products and mill test reports.
2. The independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by the Architect/Engineer and public authorities.
3. Subcontractor shall notify Construction Manager and independent firm a minimum of 24 hours prior to expected time for operations requiring services. In general, coordinate activities which require testing at weekly progress meetings to allow all parties efficient manpower utilization. The independent firm shall make efforts to comply with the changing progress of the job given reasonable notice, however should the Subcontractor fail to schedule or fail to cancel testing or laboratory services, all costs incurred will be borne by the Subcontractor.
4. Reports will be submitted by the independent firm within 5 days to the Architect/Engineer, electronically, indicating observations, results of tests and indicating compliance or non compliance with Contract Documents. Reports of discrepancy between the observed test values and the specified criteria in the contract documents are to be made within 24 hours or sooner to the Construction Manager and the Architect/Engineer.
   A. The independent firm's reports will include the following information at a minimum: date of inspection/sampling, date report issues, date test performed, project name and Construction Manager job number, lab name, address, phone and fax, name and original signature of inspector, record of weather and temperature, description of product, applicable specification section, and type of inspection/test, and location in project.
   B. Independent firm shall test concrete, masonry, asphalt and structural steel and shall interpret the test results in every case to explain compliance or noncompliance with the Contract Documents.
5. Retest Responsibility: Where results of required inspection, test, or similar service are unsatisfactory (do not indicate compliance of related work with requirements of Contract Documents), retests are responsibility of Subcontractor, regardless of whether original test was Subcontractor's responsibility. Retesting of work revised or replaced by Subcontractor is Subcontractor's responsibility, where required tests were performed on original work.

6. Responsibility for Associated Services: Subcontractor is required to cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at project site.
7. Coordination: Subcontractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of work and without the need for removal/replacement of work to accommodate inspections and tests.
8. Sampling and testing is required for the following Sections of Work or similarly identified sections and shall be performed by an independent testing lab and paid for by the Owner.
   A. Earthwork – soil testing and inspection service during earthwork operations for subgrades and fill.
   B. Asphaltic Concrete Paving – quality control testing of uncompacted asphalt concrete mix and in-place compacted pavement**.**
   C. Cast-In-Place Concrete – field quality control of concrete.
   D. Cast-In-Place Concrete – tests for concrete materials and mix design tests.
   E. Cast-In-Place Concrete – testing of FF/FL floor tolerances.
   F. Mortar – field quality control of mortar.
   G. Grout – field quality control of grout.
   H. Unit Masonry – field quality control of unit masonry and masonry assemblies.
   I. Structural Metal Framing – field quality control for welds.
   J. Structural Metal Framing – field quality control for high strength steel torqued bolted connections.
   K. Structural Metal Framing – field quality control for structural steel alignment.

2.4. SOIL COMPACTION TESTING

1. The Contracts incorporating Earthwork shall cooperate and coordinate with the soil testing and inspection service for quality control testing during earthwork operations as follows:
   A. Field density test reports.
   B. One optimum moisture-maximum density curve for each type of soil encountered.
   C. Arrange for soils engineer to be on the site for observation and testing during times when the following operations are being performed:
      i. Proof-rolling.
      ii. Compaction of subgrades and fill. During compaction operations, the Soils Engineer shall carefully monitor existing foundations to detect possible foundation movements. If movement is detected, Work shall be stopped and the Architect immediately notified.
2. Percentage of Maximum Density Requirements: Provide not less than the following percentages of maximum density of soil material compacted at optimum moisture content, for the actual density of each layer of soil material in place (coordinate with soils report).
   A. Foundations: Compact top 12 inches of subgrade and each 8 inch layer of backfill or fill material to 100 percent Standard Proctor maximum dry density.

B. Building Slabs & Steps: Compact top 12 inches of subgrade and each 8 inch layer of backfill or fill material to 90 percent Standard Proctor maximum dry density.
C. Lawn, Unpaved Areas & Borrow Pit: Compact top 6 inches of subgrade and each 8 inch layer of backfill or fill material to 90 percent Standard Proctor maximum dry density.
D. Walkways: Compact top 6 inches of subgrade and each 8 inch layer of backfill or fill material to 90 percent Standard Proctor maximum dry density.
E. Pavements: Compact top 12 inches of subgrade and each 8 inch layer of backfill or fill material to 95 percent Standard Proctor maximum dry density.
F. Underground Utilities: Provide the preceding requirements for the respective utility location(s).

3. Quality Control Testing During Construction: Testing service must inspect and approve subgrades and fill layers before further construction work is performed thereon. Tests of subgrades and fill layers will be taken as follows:
   A. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect, except that a minimum of one test shall be performed for each 15,000 square foot of buildings area.
   B. Paved Areas & Building Slab Subgrade: Make at least one field density test of subgrade for every 2,000 square feet of paved area or building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2,000 square foot of overlaying building slab or paved area, but in no case less than 3 tests.
   C. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.
   D. Trench Backfill: For each compacted backfill layer make one field density test between each drainage structure.
4. If, in the opinion of the Architect, based on reports of testing service and inspection, subgrade or fills which have been placed are below specified density, additional compaction work and testing shall be provided by the Subcontractor for the Section of the Work involved at no additional expense, until subgrades or fills meet or exceed specified density.

2.5. BITUMINOUS PAVING TESTING

1. Field quality control testing shall be performed during paving operations. Perform the following sampling or testing of asphalt concrete mixtures for quality control during paving operations. Record the locations where samples are taken to correlate with subsequent testing.
2. Test uncompacted asphalt concrete mix and report the following:
   A. Sampling: ASSHTO T168 (ASTM D979).
   B. Asphalt Cement Content: AASHTO T164 (ASTM D2172).
   C. Perform at least one initial test for paving, unless otherwise specified or directed.
3. Test in-place, compacted pavement for density and thickness, as herein specified. Perform one test for each 500 square yards but not less than one test per day, unless otherwise specified or directed.

4. The Subcontractor shall pay for and perform additional Work and testing as may be required if any of the previous tests indicate insufficient values or if directed by the Architect. Continue Work and testing until specified values have been attained.
5. Asphalt concrete material not complying with specified requirements will not be acceptable. The Subcontractor shall repair or remove and replace defective paving as directed by the Architect, at no additional cost to the Owner.

2.6. INSPECTION OF REINFORCING STEEL PLACEMENT

1. The Subcontractor incorporating Cast-In-Place Concrete – shall cooperate and coordinate with the testing laboratory to perform field inspection of the placement of reinforcing steel prior to, and in some specified instances during, the placement of concrete in all reinforced concrete structures, unless specifically noted otherwise.
2. Inspection shall include the following:
   A. All structures
      i. Size of reinforcing bars.
      ii. Measurement of bar laps.
      iii. Spacing of reinforcing bars.
      iv. Measurement of reinforcing concrete cover.
      v. Adequacy of reinforcement ties to prevent movement during concrete placement.
      vi. Placement of reinforcing chairs, bolsters and concrete blocks supporting reinforcement.
      vii. Condition of reinforcing free of corrosion scale, grease, oil and other foreign materials which would reduce bond of concrete to reinforcement.
   B. Slabs-On-Grade
      i. Nominal size of welded wire fabric.
      ii. Measurement of fabric lap.
      iii. Type, size and spacing of supports for welded wire fabric.
      iv. Adequacy of maintaining welded wire fabric in correct position during the concrete placement, and lifting fabric back in to correct position prior to set of concrete (THE TESTING LABORATORY SHALL BE PRESENT DURING THE PLACEMENT OF SLABS-ON-GRADE WHICH USE WELDED WIRE FABRIC OR REINFORCING STEEL BARS).
      v. Slabs-On-Grade with fibrous reinforcement do not require this inspection.
3. Report inspection results in writing to the Architect, Construction Manager and Subcontractor the same day that tests are made. Reports shall indicate the specific structural items inspected and the location, with column grid references, where possible to clearly identify the inspected items.
4. Additional Inspections: Where inspections indicate deficiencies and concrete placement is made prior to correction and retesting of these deficiencies or where concrete placement of any structural item is made without this required inspection, the testing laboratory shall conduct additional tests, including concrete coring, magnetic detection devices, sonic testing devices and other methods as required to verify the conformance of the reinforcing steel placement to the Contract Documents. The Subcontractor shall pay for such inspections conducted and other additional inspections as may be required when unacceptable or uninspected reinforcing steel placement is verified.

2.7. CONCRETE TESTING

1. The Subcontractor for the Work: Cast-In-Place Concrete, shall cooperate and coordinate with the testing laboratory to perform field quality control testing during concrete work.
2. Quality Control Testing During Construction: Perform sampling and testing for field quality control during the placement of concrete as follows:
   A. Sampling Fresh Concrete: ASTM C172, except modified for Slump to comply with ASTM C94.
   B. Slump: ASTM C143, one test for each concrete load at point of discharge, and one for each set of compressive strength test specimens.
   C. Air Content: ASTM C231, pressure method; one for every other concrete load at point of discharge or when the indication of change requires.
   D. Compression Test Specimens: ASTM C31, one set of 6 standard cylinders for each compressive strength test, unless otherwise directed.
      i. Cast and store 3 cylinders for laboratory cured test specimens and 3 field-cured test specimens as specified in STM C31.
   E. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above; and each time a set of compressive test specimens is made.
   F. Compressive Strength Tests: ASTM C39, one set for each 100 cubic yards or fraction thereof, of each mix design placed in a day or for each 5,000 square feet of surface area placed; 2 specimens (one field cured and one lab cured) tested at 7 days, 2 specimens (one field cured and one lab cured) tested at 28 days, and 2 specimens (one field cured and one lab cured) retained in reserve for later testing if required.
      i. When the frequency of testing will provide less than 5 strength tests for a given mix design, conduct testing strength tests for given mix design, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
      ii. When the total quantity of a given mix design of concrete is less than 50 cubic yards, the strength tests may be waived by the Architect if, in their their judgment, adequate evidence of satisfactory strength is provided.
      iii. When the strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
3. Report test results in writing to the Architect, Contractor, and ready-mix supplier on the same day that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of Subcontractor, name of concrete supplier and truck number, name of concrete testing service, concrete type and class, location of concrete bath in the structure, design compressive strength at 28 days, concrete mix promotions and materials, type and amount of fibrous reinforcement, compressive breaking strength , and type of break for both 7 day tests and 28 day tests.
4. Additional Tests: The testing service will make additional tests of in-place concrete as directed by the Architect, when test results indicate the specified concrete strengths and other characteristics have not been attained in the structure. The testing service shall conduct tests on cored cylinders

complying with ASTM C42 or by load testing specified in ACI 318 or other acceptable nondestructive testing methods, as directed. The Subcontractor shall pay for such tests conducted and other additional testing as may be required, when unacceptable concrete is verified.

5. Evaluation of Quality Control Tests: Do not use concrete delivered to the final point of placement which has slump or total air content outside the specified values.
   A. Compressive strength tests for laboratory-cured cylinders will be considered satisfactory if the averages of all sets of 3 consecutive compressive strength tests results equal or exceed the 28 day design compressive strength of the type or class of concrete; and no individual strength test falls below the required compressive strength by more than 500 psi.
   B. Strength tests of specimens cured under field conditions may be required by the Architect to check the adequacy of curing and protecting of the concrete placed. Specimens shall be molded by the field quality control laboratory at the same time and from the same samples as the laboratory cured specimens.
      i. Provide improved means and procedures for protecting concrete when the 28 day compressive strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders.
      ii. When laboratory cured cylinder strengths are appreciably higher than the minimum required compressive strengths, field cured cylinder strengths need not exceed the minimum required compressive strengths by more than 500 psi even though the 85 percent criterion is not met.
      iii. If individual tests of laboratory cured specimen produce strength or if tests of field cured cylinders indicated deficiencies in protection and curing, provide additional measures to assure that the load-bearing capacity of the structure is note jeopardized. If the likelihood of low-strength concrete is confirmed and computations indicate the load-bearing capacity may have been significantly reduced, tests of cores drilled from the area in question may be required.
   C. If the compressive strength tests fail to meet the minimum requirements specified, the concrete represented by such tests will be considered deficient in strength.
6. Deficient concrete shall be removed and replaced by the Subcontractor without additional cost to the Owner.

2.8. CONCRETE MATERIALS & MIX DESIGN

1. Concrete Materials and Mix Design: The Subcontractor(s) for Cast-In-Place Concrete shall provide the following in conformance with the requirements of the technical specification for Cast-In-Place Concrete.
   A. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94.
   B. Project Data: Submit electronic copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, waterstops, joint systems, chemical floor hardeners, and dry shake finish materials.
   C. Laboratory Test Reports: Submit electronic copies of laboratory test reports for concrete materials and mix design tests. The Architect's review will be for general information only.

Production of concrete to comply with specified requirements is the Subcontractor's responsibility.

D. Mix Design: Submit electronic copies of concrete mix designs for each type of mix required by the Concrete Schedule indicating the amount of each ingredient (by weight) in one cubic yard of concrete, the calculated water/cement ration, and the slump.

2. Tests for Concrete Materials
   A. For normal weight concrete, test aggregates by the methods of sampling and testing of ASTM C33.
   B. For light weight concrete, test aggregates by the methods of sampling and testing of ASTM C330.
   C. For portland cement, sample the cement and determine the properties by the methods of test of ASTM C33.
   D. Submit written reports for each material sampled and tested, prior to the start of Work. Provide the project identification name and number, date of report, name of Subcontractor, name of concrete testing service, source of concrete aggregates, material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for intended use.
   E. Vista at Brighton Apartments
3. Submit signed statement from ready-mix plant that concrete furnished for the Project will exactly conform on the approved design mixes**.**

2.9. TESTS FOR FF/FL ***- Refer to the Technical Specifications for Cast-In-Place Concrete***

2.10. TESTS FOR MORTAR

1. For colored and non-colored mortars, test for compressive strength by the methods of sampling and testing of ASTM C109 and ASTM C780.
   A. Provide a minimum of one set of cubes for testing per 5,000 sq. ft. of masonry wall construction and as directed by Architect.
2. Submit written reports for each material sampled and tested. Provide the project identification name and number, date of report, name of Subcontractor, name of testing service, source of aggregates, material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for intended use.
3. If the compressive strength tests fail to meet the minimum requirements specified, the mortar represented by such tests will be considered deficient in strength.
4. Deficient mortar shall be removed and replaced by the Subcontractor without additional cost to the Owner**.**

2.11. TESTS FOR GROUT

1. Grout for filling reinforced or unreinforced concrete masonry cores or brick cavities test for compressive strength by methods as described in the technical specifications for Masonry Grout.
   A. Provide a minimum of one set of 3 test specimens for testing per 5000 sq. ft. of masonry wall construction or for each ready mix truck load of grout and as directed by the Architect.

2. Submit written reports for each material sampled and tested. Provide the project identification name and number, date of report, name of Subcontractor, name of testing service, source of aggregates, material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, specified location where material represented by sample is used and test results. Indicate whether or not material is acceptable for intended use.
3. If the compressive strength tests fail to meet the minimum requirements specified, the grout represented by such tests shall be considered deficient in strength.
4. Deficient grout shall be removed and replaced by the Subcontractor without additional cost to the Owner.

2.12. TEST OF CONCRETE MASONRY PRISMS

1. When required by the Technical Specifications, construct a set of 3 masonry prisms using mortar and concrete masonry units to be used in the masonry work. Unless otherwise noted, construct prisms 8 inches by 8 inches by 16 inches high (nominal) in compliance with ASTM E447, Method B.
2. When prism tests are required to establish the strength of masonry in lieu of Masonry Inspection, provide a minimum of one set of 3 masonry prisms for testing for each 5,000 sq. ft. (gross) of masonry wall construction.
3. Submit written reports for each prism tested. Provide the project identification name and number, date of reports, name of Subcontractor, name of testing service, name of material suppliers, specific location where masonry represented by the prism is used, compression test strength results, and specified required strength.
4. If the compressive strength tests fail to meet the minimum strength specified in the Plans, the masonry represented by the tests shall be considered deficient.
5. When tests indicating deficient masonry represent masonry already constructed, such masonry shall be removed and replaced by the Subcontractor without additional cost to the Owner. In lieu of removal and replacement, additional cores may be grouted as required and directed by the Architect without additional cost to the Owner.

2.13. MASONRY INSPECTION

1. Provide masonry construction inspection of concrete or brick masonry walls indicated as requiring inspection on the Masonry Plans to ensure that masonry construction is in conformance with Contract Documents. Masonry inspection is required for those masonry elements which must be constructed to attain high design strengths.
2. Inspection shall use NCMA-TEK 18-3 Quality Assurance as a guideline.
3. The individual(s) who will perform the masonry inspection shall be present for the Pre-masonry Conference.
4. The Masonry Inspector(s) shall prepare a written report or reports for each day of inspection. Masonry Inspection Report Form (DIV.1-MIR.-1) shall be used for all inspection reports.
5. The masonry inspector shall be present and observe all masonry construction operations in walls requiring inspection. The masonry inspector shall be present at the project site within sufficient time, in advance of grouting operations, to inspect the construction to insure its conformance to the

Contract Documents and that grouting may proceed. No grouting shall be permitted unless the masonry inspector is present and has indicated that the masonry construction is properly prepared for the grouting operation.

2.14. WELDING QUALITY CONTROL

1. Welding operators shall be qualified under the provisions of the AWS Structural Welding Code on test pieces in positions and with clearances equivalent to those actually to be encountered in construction. Welders shall make only those types of welds for which they are specifically certified.
2. Welds requiring inspection shall be so indicated in the Drawings.
   A. Welds indicated as requiring visual inspection shall be visually inspected by an independent inspector, acceptable to the Architect and Construction Manager prequalified to make the weld being inspected. Welders and inspectors shall be prequalified by the American Welding Society Qualification Test.
3. Submit written reports for each weld tested. Provide project identification and number, date of report, name of Welding Subcontractor, name of testing services, location of weld, type of weld, and test results. Indicate whether or not weld is acceptable for intended use.
4. If by inspection, welds fail to meet minimum acceptable criteria, the welds shall be cut out and replaced.

2.15. BOLTED STRUCTURAL CONNECTIONS QUALITY CONTROL

1. The Subcontractor for the Work of Structural Metal Framing, shall coordinate with a separate testing laboratory, employed and paid by the Owner, to perform field quality control inspection of slip-critical and snug-tight bolted connections.
   A. Inspection of slip-critical connections shall be visual. The inspector shall be present at the beginning of steel erection to ensure that the erector is conforming to the Contract Documents and AISC Specifications. The inspector shall verify that the erector is marking the bolts and nuts prior to the turn-of-nut procedure. Ten percent of all slip-critical bolted connections shall be observed as they are installed. Any connections which, in the opinion of the inspector, do not meet the tightening requirements of the Contract Documents shall be corrected by the erector.
   B. Inspection of snug-tight connections shall be made by use of a spud wrench. Ten percent of all snug-tight bolted connections selected randomly over the entire limits of the building structure shall be tested to verify tightness. If more than 20 percent of the bolts tested do not meet the General Requirements of the Contract Documents, the erector shall be required to retighten all snug-tight bolted connections on the Project.

2.16. STRUCTURAL STEEL ALIGNMENT QUALITY CONTROL

1. The Subcontractor for the Work of Structural Metal Framing shall coordinate, with a separate testing laboratory, to perform field measurement of structural steel beams, columns, joist, and deck alignment.
2. Alignment shall be measured and compared to AISC “Code of Standard Practice for Steel Buildings and Bridges.”

3. The Testing Agency shall submit, to the Architect, a written report summarizing the measurements performed and the equipment used in the field work. Where alignment fails to meet AISC requirements, the Subcontractor for the work in the technical specifications for Structural Metal Framing shall make the required corrections.

PART 3 EXECUTION

1. General: Upon completion of inspection, testing, sample-taking, and similar services performed on work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including defects in visual qualities of exposed finishes. Except as otherwise indicated, comply with requirements of Contract Documents for "Cutting and Patching." Protect work exposed by or for service activities and protect repaired work.

END OF SECTION

01 5000

CONSTRUCTION FACILITIES

All materials, procedures, installations, etc., shall be in full compliance with requirements of Rules for Construction Safety issued pursuant to Occupational Safety and Health Act / Michigan Occupational Safety and Health Act.

1.1. SECTION INCLUDES

1. Temporary Access
2. Temporary Facilities and Utilities
3. Temporary Protection and Controls

1.2. RELATED WORK

1. The Work of this Section shall be included as a part of the Contract Documents of each Subcontractor on this Project. Where such work applies only to one Subcontractor, it shall be defined as to which Subcontractor the Work belongs. Each Subcontractor as defined herein shall provide such temporary facilities as specified and as indicated on the Drawings.
2. The Subcontractor responsible for installing and maintaining such temporary facilities shall remove from the premises temporary work erected by them at the completion of the Project, or when requested to do so by the Construction Manager. Temporary structures and facilities become the property of the party furnishing them. Leave premises clean and in acceptable conditions as approved by the Construction Manager and Architect.
3. Use of Existing Facilities:
   A. Construction personnel will not be allowed the use of any adjacent Owner's facilities including, but not limited to, the cafeteria, toilet facilities, tools, equipment, etc.. The other buildings and facilities of the Owner's complex shall be off limits to all construction personnel without prior approval of the Construction Manager**.**

1.3. TEMPORARY ACCESS

1. New or existing driveways, parking areas, or other pavements may only be used for access and staging if approved by the Construction Manager. Otherwise, temporary access shall be installed and used as directed by the Construction Manager.
2. Each subcontractor shall be responsible for access to the work area from site access roads and lots shown or described in the Contract Documents. The use of equipment suitable for the site conditions is the responsibility of each subcontractor. Each subcontractor shall also be responsible for immediately restoring the site to an evenly graded condition to allow for proper water drainage and unencumbered use by other subcontractors.
3. Construction parking on or adjacent to site will be on a limited basis only. Construction Manager shall approve any onsite parking. Each Subcontractor shall be responsible for transportation to the site of its employees.

4. Each Subcontractor shall be held responsible for damage to the existing surfaces resulting from operations relative to Work being performed under this Contract; and repair damaged areas to their original condition, as approved by the Construction Manager and Architect, at no cost to the Owner.
5. All Subcontractors shall limit their use of the premises for work and for storage, to allow for:
   A. Work by other Subcontractors
   B. Owner occupancy
   C. Public use and safety
   D. Use of corridors at all times

1.4. TEMPORARY OPENINGS FOR ELECTRICAL, MECHANICAL AND OTHER TRADES

1. Temporary openings not called for on the Drawings, which may be required for the purpose of bringing equipment into the buildings or for placing same, shall be performed as approved by the Construction Manager. The Subcontractor shall perform the Work of providing and maintaining such openings and of restoring the structure.
2. The Subcontractor whose equipment or work requires temporary openings is to bear the cost involved in providing such openings and restoring the structure. The Subcontractor requiring the opening shall give ample notice of its size and location.
3. Holes provided in general construction work to permit installation of lines for temporary mechanical and electrical services shall be restored by the Subcontractor doing the affected construction work, after removal of such lines, at no extra cost.

1.5. PROJECT OFFICE

1. The Construction Manager shall provide and maintain during the construction of the Project, adequate construction office facility at the site solely for use by Construction Manager, Architect and Owner.
2. Subcontractors may also supply mobile offices and storage facilities for their use under the same conditions, if approved by the Construction Manager. Remove from, clean, and restore premises when directed by Construction Manager.
   A. Temporary utilities, electrical service, and telephone service shall be provided by each Subcontractor for their respective construction trailers, offices, work areas, etc., and shall be located at the discretion of the Construction Manager.
   B. As required by the Construction Manager, due to construction requirements and phasing, moving and relocating of trailers and offices will be the responsibility of the Subcontractor involved, including costs associated therewith.
3. Construction Manager shall designate a location for construction trailers. The Construction Manager shall coordinate placement and scheduled duration of their presence on the site. Each Subcontractor is responsible to verify that field offices, trailers, and storage sheds shall be in accordance with the local fire marshal having jurisdiction.
4. Temporary offices and sheds including foundations must be removed within seven (7) days of written notice from the Construction Manager including restoration of grade. The Construction Manager, at the Subcontractor's expense, will remove structures not removed in a timely manner.

5. Construction Manager will coordinate a temporary electric service at the location of temporary office trailers for use by Subcontractors. No electric heat devices are to be connected to this service. Subcontractor shall arrange for connection and disconnection of this service at their own expense.
6. Project Sign:
   A. If required by the Owner, the Construction Manager shall provide a job identification sign, professionally lettered and maintained, giving name of Project, the name and address of the Owner, the Architect, and the Construction Manager.

1.6. TELEPHONE

1. Subcontractors and other parties shall provide their own temporary telephone service as they may require at no cost to the Owner or Construction Manager. Use of the Construction Manager phone is prohibited, except in the event of an emergency.

1.7. SCAFFOLDING AND HOISTING

1. Each Subcontractor is responsible to provide and maintain ladders, scaffolds, and other staging equipment required to complete their work. Each Subcontractor, in accordance with all applicable safety regulations, shall maintain such ladders, scaffolds, and staging equipment.
2. Each Subcontractor is responsible for their own hoisting of materials or equipment at their own cost to complete the Work of their Contract.
3. Permanent elevators cannot be used for construction hoisting.

1.8. TEMPORARY STAIRS, LADDER, RAMPS, RUNWAYS, AND BARRICADES

1. Each Subcontractor is to provide and maintain all necessary temporary stairs, ladders, ramps, and runways to facilitate conveyance of men, materials, tools, and equipment for proper execution of their work. Each Subcontractor shall provide protection and safety barricades, devices, covers, etc., as it relates to the safe conduct of their work in accordance with OSHA requirements.
2. Subcontractors performing excavation work shall be responsible to furnish, install, and maintain temporary barricades and/or fencing of all open excavations until such a time that backfilling is complete. Flasher lights shall be provided on barricades and fencing in accordance with OSHA Standards.
3. As a minimum, all barricades across roads and walks shall have lights on them in working condition.
4. The CM will assign to one of the Work Categories the installation of temporary guardrails at the building floor perimeters, interior shafts, roof areas, or other openings. These temporary guardrails or barricades shall be left in place until no longer required. The Subcontractor shall maintain and remove said guardrails. Each Subcontractor that disturbs temporary protection to facilitate their work is responsible to reinstall to its original condition the guardrail or barricade system for the protection of the workers and others until final construction of perimeter exterior wall or shaft openings is completed. The individual Subcontractors shall provide other protection and safety barricades, devices, covers, etc., as it relates to their work in accordance with local, state, and federal regulations.

1.9. UTILITY PROTECTION

1. Existing utility lines and structures indicated or known, and utility lines constructed for this Project shall be protected from damage during construction operations.
2. Work categories that include excavation shall locate and flag all lines and structures before beginning excavation and other construction operations.
3. When utility lines and structures that are to be removed or relocated are encountered within the area of operations, notify the Construction Manager and affected utility in ample time for the necessary measures to be taken to prevent interruption of the service.
4. Damage to existing utility lines or structures not indicated or known shall be reported immediately to the Construction Manager and the affected utility.
5. Each Subcontractor shall provide and maintain proper shoring and bracing for existing underground utilities, sewers, and building foundations, encountered during their excavation work, to protect them from collapse or movement or other type of damage until such time as they are to be removed, incorporated into the new work, or can be properly backfilled upon completion of new work. All such disruptions of services shall be limited to a maximum of 4 hours with prior permission of the Construction Manager and Owner. Prior to beginning any excavation, the Subcontractor shall contact MISS DIG and utility companies for the location of all existing underground services.
6. Utilities and/or other services which are shown, or not shown but encountered, shall be protected by the Subcontractor from any damage from any work and operations of the contract, unless or until they are abandoned. If the utilities or services are not abandoned at time of damage, the Subcontractor shall immediately repair any damage from their work or operations and restore the utilities and services to an equal or better condition than that which existed prior to the damage.
7. Each Subcontractor shall be responsible for all damage to the Project including the existing building and grounds due to their operations under this Contract. Repair or replacement of damaged items shall be to the satisfaction of the Owner.

1.10. TEMPORARY BARRIERS

1. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
2. Protect stored materials and structures from damage.
3. Each Subcontractor shall provide and pay for the construction and removal of temporary barricades as required for safety and security for their specified portion of the Work.

1.11. SECURITY

1. The Subcontractor shall maintain the buildings in a secured condition at all times.
2. The Subcontractor is to provide for all their security needs, including that needed for all tools, equipment, devices, etc., required or otherwise used for construction of this project, and for all materials which have been paid for by the Owner, but not yet incorporated into new construction.
3. The Subcontractor shall also provide adequate security and traffic control to protect the public from their operations.

4. Site parked equipment, operable machinery, and hazardous parts of the new construction subject to mischief and accidental operation shall be inaccessible, locked, or otherwise made inoperable when left unattended.
5. Subcontractors shall advise the Construction Manager of any theft or damage which might delay the execution of the Work and furnish the Owner and Construction Manager with a copy of any theft report filed with local, county, or state agencies.
6. The Construction Manager is not responsible for damage, liability, theft, casualty, or other hazard to the automobiles or other vehicles, nor to injury including death to occupants of automobiles or other vehicles on the Owner's property.
7. The Construction Manager or Owner may establish additional security policies and procedures intended to protect the Owner's property and the liability interest of the Owner. All Subcontractors will be required to cooperate with the Construction Manager in implementing these procedures.

1.12. TEMPORARY TOILET FACILITIES

1. The Construction Manager shall provide temporary toilet facilities of an approved chemical type or as required by law, and in the quantity Construction Manager determines necessary. Temporary toilets shall be for use by all trades on the job.

1.13. TEMPORARY ELECTRICAL POWER AND LIGHT

1. The Owner shall pay for the cost of electrical energy used on this project.
2. The Electrical Subcontractor shall furnish, install, maintain, connect and disconnect the temporary electric service, main disconnect means, wiring, and distribution equipment for temporary lighting and power tool usage during the construction. Source of temporary power and light distribution is to be from existing electric distribution systems where available. If existing power source not available, Construction Manager will arrange for other.
3. Temporary service shall be 120/240 volt, single phase, three wire plus ground. Temporary electric service distribution panel shall be located in a weather tight enclosure with globe and guard LED or CFL lighting fixture, light switch, receptacle, and locked doors by the Subcontractor. The size and capacity of service, (i.e., 120/208 or 120/240 volt) is to be reviewed with the Construction Manager and Owner for approval prior to installation.
4. Electrical Subcontractor shall provide the following temporary lighting and power distribution system for this Project.
   A. Prior to the start of work, the Electrical Subcontractor shall provide and maintain service locations throughout the building such that any point in the building may be reached with a 100 ft. extension cord. As partitions are completed, service locations shall be added and/or relocated to maintain the capacity of reaching any point in the building with a 100 ft. extension cord. Each service location shall have a minimum of eight (8) ground fault protected duplex receptacles, and fed by a minimum of four (4) 20 amp circuits.
   B. As the building structure is completed, Electrical Subcontractor shall provide and maintain throughout the building, 20 amp, 120 volt grounded circuits of non-metallic sheathed cable supplying one (1) lamp holder for each 500 square feet of floor area. As partitions are completed,

lamp holders shall be added and/or relocated to provide (1) each for each 100 square feet of floor area with a minimum of (1) per room. Each lamp holder shall be furnished with a 150 watt equivalent lamp and guard with no more than (12) such outlets per circuit.

C. The Electrical Subcontractor shall provide and maintain temporary electrical service to the mechanical equipment rooms as required by that Subcontractor for the operation of their equipment for testing.
D. All wire and cable shall be sized to hold voltage drop at all outlets to a maximum of 5% total from transformer.
E. Appropriately rated ground fault detection and interruption devices shall protect circuits and feeders.

2. Lamps for temporary lighting shall be provided and maintained by the Electrical Subcontractor at their expense. Every temporary lamp outlet must be properly lamped throughout the construction; dark or burned out lamps shall be immediately replaced. Use rough service lamps.
3. Wiring and associated costs of Subcontractor's offices, trailers, storage facilities, etc., used during construction, shall be the responsibility of the individual Subcontractors requiring same.
4. Where a Subcontractor requires the use of energy at places other than those herein specified or of an amount greater than would be available from the specified temporary service, the Subcontractor shall make independent arrangement with the Electrical Subcontractor for the service at their own expense.
5. When permanent facilities are ready for operation, they may be used for temporary light and power if approved by the Construction Manager.
6. Upon approval of use and completion of the changeover to the permanent electrical system, the Electrical Subcontractor shall remove portions of the temporary electrical service, including power and lighting, distribution and/ or utilization, equipment, and wiring. Additionally, Electrical Subcontractor shall continue to maintain temporary lighting and shall provide a minimum of one duplex outlet per floor throughout the building.
7. Should the demolition of existing facilities require that the facilities which are to remain be interrupted for a duration of time exceeding one hour, the Electrical Subcontractor for this Project shall provide proper and adequate temporary electrical service to the facilities remaining until such time as permanent service to the remaining facilities can be restored.
8. It is the intent of the Construction Manager that this temporary power and lighting service be installed immediately upon award to the Electrical Subcontractor. Subcontractors needing power prior to the time that this temporary power service is available shall provide their own temporary power generator equipment at their own expense.

1.14. TEMPORARY HEATING - AFTER BUILDING ENCLOSURE

1. Heating required after enclosure of the additions or designated portion thereof shall be subject to the approval of the Construction Manager and Architect.
2. After the building or designated portion have been enclosed and temporary heat is required, as directed by the Architect and the Construction Manager, the HVAC/Mechanical Subcontractor shall provide temporary heat using one or both of the 2 following methods:

A. Method 1 - The use of a Permanent Heating System
   i. The permanent heating system may be used for temporary heating where available and if approved by the Architect. If the permanent system is used, the Mechanical Subcontractor shall have installed in their permanent location such fan systems, heating coils, convectors, etc., as approved by the Architect Provide such controls as are necessary to maintain the temperatures required.
   ii. Temporary filters shall be used in the permanent system and be replaced with new, permanent, filters at Substantial Completion.
   iii. Equipment so used shall be cleaned and restored to new conditions except for ordinary wear, prior to final acceptance, and its use shall in no way negate the Owner's one year warranty specified to commence on the date of Substantial Completion. The HVAC Subcontractor must include costs required for an extended warranty given the above use conditions.

B. Method 2 - The use of Individual Portable Units
   i. If the permanent system is not fully operable or does not have sufficient controls to maintain the necessary heat in light of existing conditions, the Mechanical Subcontractor shall provide, maintain, and supervise the operation of Construction Manager approved temporary portable units, such as oil or gas fired unit heaters, furnaces, direct fired make up air units, or similar equipment, no electric heat permitted. Such units shall be properly vented, piped, and wired and shall be provided with thermostat for temperature control and with required safety controls.
   ii. Electrical wiring required for temporary heating shall be provided by the Mechanical Subcontractor from temporary wiring service, except that the Electrical Subcontractor will need the wiring to permanent equipment mounted in its permanent location that is used for temporary heating.

3. Cost of Temporary Heating System
   A. The cost of installing the temporary heating systems in accordance with Method 1 above shall be by the Mechanical Subcontractor. The Mechanical Subcontractor shall include in their base bid the total amount required for the operation and maintenance of the temporary heating system. This cost shall include the equipment, personnel labor, parts, operation, and the maintenance, including periodic checking and operation of the system each night during the work week and during the day and night on Saturdays, Sundays, and holidays for the duration of the actual heating period. The operation and maintenance of the temporary heating system shall be provided from the time of authorization and requirements to start as determined by the Construction Manager until it is determined that temporary heat is no longer required in the building or designated areas.
      i. The cost of an extended warranty on the heating system components shall be borne by the Mechanical Subcontractor, and included in their their base bid as necessary to guarantee that the Owner receives the entire specified warranty for the equipment, commencing on the date of Substantial Completion for the Project.
4. The cost of installing the temporary heating systems in accordance with Method 2 above shall be borne by the Mechanical Subcontractor.

5. The Owner will pay for the cost of fuel and energy used to operate the temporary heating system in accordance with Method 1 and Method 2 as described above.

1.15. TEMPORARY VENTILATION

1. Once building enclosure is obtained, the HVAC/Mechanical Subcontractor shall ventilate enclosed areas to assist in the cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases. Each Subcontractor must provide required ventilation to exhaust toxic fumes generated by their work.
2. Utilize existing ventilation equipment if safe and prudent and only after obtaining Construction Manager approval. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations. Otherwise, provide such temporary ventilation as may be necessary for Subcontractor's operations.
3. Permanent equipment shall not be used for temporary ventilation unless maintained and operated as follows:
   A. Return air ducts shall not be used.
   B. Supply air to each unit shall be filtered.
   C. Permanent filters should be removed, temporary filters used during construction and then replaced prior to turn over.
   D. Temporary filters shall be constantly checked and changed when necessary.
   E. System is turned over in a clean condition at substantial completion. Provide mechanical duct cleaning if inspection shows evidence of debris or dirt.
   F. Operation of permanent equipment for ventilation shall not negate the Owner's warranty specified to commence on the date of Substantial Completion.
   G. The cost of an extended warranty on the ventilation system components shall be borne by the Mechanical Subcontractor, and included in their base bid as necessary to guarantee that the Owner receives the entire specified warranty for the equipment, commencing on the date of Substantial Completion for the Project.

1.16. TEMPORARY WATER SERVICE

1. The Mechanical Subcontractor for each building shall connect to existing water supply, install permanent meter, and extend temporary water service to temporary taps at locations as directed by the Construction Manager. The Owner shall be responsible for the cost of water used on Project.
2. The Mechanical Subcontractor shall provide a minimum of 2 (or more if required by Construction Manager) hose bibs with vacuum breakers at each temporary tap. Distribution piping shall be sized to provide sufficient pressure at outlet of 100 ft. hose attached to hose bib. Mechanical Subcontractor shall maintain and service temporary water supply. This shall include, but not limited to, replacement and repair of damaged pipe and equipment due to freezing or other causes.
3. Mechanical Subcontractor shall install permanent water service as soon as possible and use to supply temporary taps.
4. Each Subcontractor shall provide their own means of conveying water from temporary water taps to their work.

1.17. TEMPORARY FIRE PROTECTION

1. Each Subcontractor shall at all times exercise every precaution for prevention of smoke hazard and fire. Further, each shall make timely and adequate provisions for protection and safety of persons and property in event of fire.
2. The Subcontractor for the General Trades Work Category (EDITOR NOTE: Update this item and assign this to a work category other than General Trades if you do not have a General Trades work category) shall provide and maintain in working order during construction not less than 1 fire extinguisher for every 100 foot of travel or 3,000 SF, 1 fire extinguisher at every stairwell on each floor, and 1 additional fire extinguisher for each additional 3,000 SF of floor area.
3. Fire extinguishers provided by the Subcontractor of the General Trades Bid Category and other Subcontractors shall be "all purpose" and not a water type to meet the approval of the Fire Underwriter's laboratory and will be inspected at regular intervals and recharged if necessary.
4. No open fires shall be permitted. Subcontractors shall not be allowed to start fires with gasoline, kerosene, or other highly flammable materials.
5. Only fire-resistant tarpaulins shall be used on this Project.
6. The permanent fire protection water supply, fire extinguishing equipment, and fire protection system shall be installed at the earliest possible date. Shut down for a minimum period of time as approved by the Construction Manager and Owner. As each sprinkler system is completed and placed in service, the control valve shall be sealed. Permission to break seals and close sprinkler valves shall be given only by the Construction Manager with approval of the Owner.
7. Subcontractors are notified that combustion engine equipment, tar kettles, and other items causing noxious odors or fumes will not be allowed in the building or near air intake louvers. If location of intake louver locations are in doubt, consult with the Construction Manager.
8. Whenever work of particularly hazardous nature is being done, party doing such work shall provide additional and/or special fire protection and extended fire watches may be required.
9. Gas welding equipment may only be used upon written permission of the Construction Manager. Gasoline torches or burners will not be permitted. When welding or flame cutting is permitted, Subcontractor shall adhere to the Hot Work Permit Requirements of the Granger Construction Safety & Health Manual. This requirement shall be STRICTLY observed and enforced by all Subcontractors.
10. All combustible trash, refuse, etc., must be removed from site and legally disposed of after each day's work. If Subcontractor fails to comply, Construction Manager will have it removed at Subcontractor's expense. The decision of the Construction Manager shall be final without recourse in that matter.

1.18. ENVIRONMENTAL PROTECTION

1. In order to prevent and to provide for abatement and control of environmental pollution arising from the construction activities of the Subcontractor and their subcontractors in the performance of this Contract, they shall comply with applicable federal, state, and local laws, and regulations concerning environmental pollution control and abatement as well as the specific requirements stated elsewhere in the Contract Documents.

2. No Subcontractor shall pollute water resources with fuels, oils, bitumen's, calcium chloride, acids or harmful materials. It is the responsibility of each Subcontractor to investigate and comply with applicable federal, state, county, and municipal laws concerning pollution of rivers and streams. Work under this Contract shall be performed in water resources through or adjacent to the project areas.
3. No burning of debris or other material on site will be allowed.

1.19. MOISTURE, SEDIMENT CONTROL, AND PUMPING

1. Each Subcontractor shall furnish necessary equipment, take necessary precautions, and assume the entire cost of sediment control, also handling and properly disposing of sewerage, seepage, storm surface, floor, and underground water, and water flows which may be encountered during the construction of their work. The manner of providing sediment control and handling of water or water flows shall meet with the approval of the Owner, and the entire cost of Work shall be included in the Base Bid of Work to be done under each Contract.
2. Install approved temporary erosion control devices when discharge velocity of pumping equipment causes soil erosion at the point of discharge.
3. Pumping and disposal of surface water and ground water at foundation excavations is the responsibility of the Subcontractor for excavation of those foundations.
4. Snow Removal:
   A. Subcontractors performing Work under exposed conditions shall cover, protect from, and remove snow and ice as required for the protection and execution of their Work.
   B. The CM will arrange for the removal of snow from parking areas and access roads.

1.20. DEBRIS AND DUST CONTROL

1. All Subcontractors must exercise caution to prevent debris or dust from blowing onto adjacent areas of the project site, properties or streets. These controls must be exercised from start of construction operations until contract is determined to be complete by Construction Manager and Architect/Engineer.
2. Prevent empty bags, cartons, or other wrappings from blowing around project site and onto adjacent properties and/or streets.
3. The Subcontractor assumes all liability for the generation of dirt, dust, sediment, soil or other debris which blow, drift, fall or are otherwise found on any property and which arise from or are in any manner connected with Subcontractor's work on jobsite.
4. At least once each week or more often as the Construction Manager shall direct, all Subcontractors shall contribute labor and/or funds to thoroughly clean the worksite of trash, debris, dirt, etc.
5. Refer to Section 01 7000 – Execution Requirements

END OF SECTION

01 6000

PRODUCT REQUIREMENTS

1.1. SECTION INCLUDES

1. Products
2. Transportation and handling
3. Storage and protection
4. Product options
5. Substitutions

1.2. RELATED SECTIONS

1. Section 00 2113 – Instructions to Bidders
2. Section 01 4000 Quality Control: Product quality monitoring.
3. Section 01 5000 - Temporary Facilities: Weather Protection.

1.3. PRODUCTS

1. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
2. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
3. Provide interchangeable components of the same manufacturer, for similar components.

1.4. TRANSPORTATION AND HANDLING

1. Transport and handle products in accordance with manufacturer's instructions.
2. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.5. STORAGE AND PROTECTION

1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight, climate controlled enclosures.
2. Provide off site storage and protection when site does not permit on site storage or protection.
3. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
4. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

5. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.6. PRODUCT OPTIONS

1. General:
   A. Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
2. Proprietary Specification Requirements:
   A. Where only a single product or manufacturer is named, provide the product indicated.
3. Semi-proprietary Specification Requirements:
   A. Where two or more products or manufacturers are named, provide one of the products or manufacturers indicated. Where one product and manufacturer is named and other manufacturers are listed, the other manufacturer's equivalent product may be acceptable subject to compliance with Contract requirements, including specifications of the named product, as determined by the Owner's Representative.
4. Non-Proprietary Specifications:
   A. When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Subcontractor to use of these products or manufacturers only, the Subcontractor may propose any available product that complies with contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
5. Descriptive Specification Requirements:
   A. Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
6. Performance Specification Requirements:
   A. Where Specifications require compliance with performance requirements, provide products that comply with the requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
   B. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
7. Compliance with Standards, Codes and Regulations:
   A. Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
8. Visual Matching:
   A. Where Specifications require matching an established Sample, the Owner's Representative decision will be final on whether a proposed product matches satisfactorily.
9. Visual Selection:
   A. Where specified product requirements include the phrase ". . . as selected from manufacturer's standard colors, patterns, textures." . . or a similar phrase, select a product and manufacturer

that complies with other specified requirements. The Owner's Representative will select the color, pattern and texture from the product line selected.

10. Allowances:
    A. Refer to individual Specification Sections and "Allowance" provisions in Division 01 for allowances that control product selection, and for procedures required for processing such selections.

1.7. SUBSTITUTIONS

1. Architect/Engineer will consider requests for Substitutions prior to the deadline listed in Section 00116 Notice to Bidders.
2. Substitutions may be considered after bids when a product becomes unavailable through no fault of the Subcontractor.
3. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
4. A request constitutes a representation that the Subcontractor:
    A. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
    B. Will provide the same warranty for the Substitution as for the specified product.
    C. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner or other affected Subcontractors.
    D. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
6. Substitution Submittal Procedure:
    A. Submit electronic copy of the Request for Substitution form for consideration. Limit each request to one proposed Substitution.
    B. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
    C. The Architect/Engineer will notify the Subcontractor in writing, through the Construction Manager, of their decision to accept or reject request.

END OF SECTION

01 7000

EXECUTION REQUIREMENTS

SECTION INCLUDES

1. Cutting and Patching
2. Alteration Project Procedures
3. Construction Cleaning
4. Construction Waste Management
5. Starting of Systems
6. Close-out Procedures.
7. Punch List
8. Project Record Documents.
9. Operations & Maintenance Manual
10. Guarantees and Warranties

1.1. CUTTING AND PATCHING

1. Each Subcontractor shall make arrangements with other Subcontractors and the CM for fitting their Work into the general construction. Where the Subcontractor was given sufficient information as to required openings prior to construction, the cost for additional cutting and restoring shall be paid for by the Subcontractor failing to provide the required openings.
2. Each Subcontractor shall be responsible for cutting, fitting, and patching that may be required to complete their work. Subcontractors shall not endanger Work of other Subcontractors by cutting, excavating, or otherwise altering Work: and shall not cut or alter the work of another Subcontractor except with written consent of the CM. Costs caused by defective or ill-timed work shall be borne by the party responsible.
3. Submit written request in advance of cutting or alteration which affects:
   A. Structural integrity of any element of Project.
   B. Integrity of weather exposed or moisture sensitive element.
   C. Efficiency, maintenance, or safety of any operational element.
   D. Visual qualities of sight exposed elements.
   E. Work of Owner or separate contractor.
4. Include in request:
   A. Identification of Project.
   B. Location and description of affected work.
   C. Necessity for cutting or alteration.
   D. Description of proposed work, and products to be used.
   E. Alternatives to cutting and patching.
   F. Effect on work of Owner or separate contractors.
   G. Written permission of affected separate contractors.
   H. Date and time work will be executed.

5. Primary Products: Those required for original installation.
6. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
7. Beginning of cutting or patching means acceptance of existing conditions.
8. Provide protection from elements for areas which may be exposed by uncovering work.
9. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
10. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior approval. Do not pound or make openings with hammers without approval of Construction Manager.
11. Restore work with new products in accordance with requirements of Contract Documents.
12. Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
13. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material to full thickness of the penetrated element, and provide escutcheon plates where exposed.
14. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Patchwork is subject to Construction Manager or Architect approval.
15. Subcontractors shall coordinate cutting and patching with other Subcontractors to avoid duplication of efforts and to avoid recutting completed work.
16. Requirements for Structural Work:
    A. Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
    B. Prior to removing existing construction, provide temporary sheeting, underpinning, shoring, and bracing to carry the loads and stresses withstood by any removed items. Subcontractor is responsible for the adequacy of same, as well as for any damage to the existing building, or contents thereof, resulting from inadequate sheeting, underpinning, shoring, and bracing.
    C. Obtain acceptance of the cutting and patching procedure before cutting and patching structural elements.
17. Operational and Safety Limitations:
    A. Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
    B. Obtain Owner's and/or governing agency approval of the cutting and patching procedure before cutting and patching operating elements of safety related systems.
18. Visual requirements:
    A. Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Owner's Representative's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Work that is cut and patched in a visually unsatisfactory manner shall be removed and replaced.

1.2. ALTERATION PROJECT PROCEDURES

1. Verify that demolition is complete, and areas are ready for installation of new Work.

2. Beginning of restoration Work means acceptance of existing conditions.
3. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
4. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
5. Remove debris and abandoned items from area and from concealed spaces.
6. Subcontractor shall remove existing construction items, materials, etc., noted on drawings to be removed or otherwise required to be removed in order to properly execute any and all remodeling, new construction and related work required for respective work category.
7. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
8. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
9. Coordinate work of alternations and renovations to expedite completion .
10. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes. Patch or replace portions of existing surface which show imperfections prior to re-finishing.
11. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
12. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect/Engineer.
13. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect/Engineer review.

1.3. CONSTRUCTION CLEANING

1. The Work of this Section shall be included as a part of the Contract Documents of each Subcontractor on this Project. Where such Work applies to only one Subcontractor, it shall be defined within the Specification as to which Subcontractor the Work belongs.
2. Recognizing that construction processes create large amounts of debris, waste material, dirt and other rubbish and that the accumulation of these products impedes works progress and are a safety hazard, an eyesore, and a violation of local regulations, each Subcontractor who bids and accepts a contract for any portion of the work, accepts the positive responsibility of keeping the work site clean as defined herein and agrees to comply with the spirit as well as the letter of this specification. If in the sole opinion of the Construction Manager, the Subcontractor does not perform clean up satisfactorily, the Construction Manager will order clean up to be done by another source and deduct cost thereof from moneys due to the Subcontractor or among various Subcontractors proportionately in such a manner as seems proper to the Construction Manager.
3. The Construction Manager reserves the right to act on behalf of the Owner pertaining to the cleanup responsibility that is a part of each Subcontractor's Work. The cleaning up included in the General

Conditions and the statement concerning cleanup which is included in each Subcontractor's Scope of Work will serve as the required notice called for in the General Conditions.

4. DAILY DEFINABLE CLEANING
   A. Each Subcontractor shall effectively confine dust, dirt, and noise to the actual construction area as approved by the Construction Manager. As debris is created, it will be the responsibility of each Subcontractor to place their their recyclables, rubbish and debris into dumpster type containers provided by the Construction Manager. On a daily basis, identifiable debris and waste or recyclable materials will be cleaned up by the Subcontractor responsible for generation of the waste.
   B. Housekeeping Directives for definable debris (see sample at the end of this section) will be issued to all Subcontractors not fulfilling their definable debris clean-up responsibilities. If this cleanup is not performed to the satisfaction (evaluating both quality and timing) of the Owner or the Construction Manager, it will be performed by others at the Subcontractor's expense. All charges, including related administrative costs (including a markup of 15%) as incurred by the Construction Manager for definable cleanup completed by the Construction Manager or at their direction will be deducted from the current progress payment due the Subcontractor.
   C. Cleaning Equipment (Brooms, Shovels, Barrels, etc.) and accessories (dust masks, etc.,) will be the responsibility of each Subcontractor to provide for their clean up.
5. COOPERATIVE CLEANING
   A. One day each week (day to be determined by the Construction Manager) and more often if necessary, each Subcontractor shall perform an overall cooperative cleanup of the project, as directed by the Construction Manager. This cooperative cleaning is for purpose of cleaning debris and material from the jobsite. The clean-up will be completed under the direction of the CM in the locations designated by the CM. Cooperative cleanup efforts will involve the required amount of resources from the trades on site during the subject week as determined by the CM.
   B. Each Subcontractor working on this Project will provide 4 manhours for each 200 manhours expended per week or fraction thereof. This labor is to be dedicated to indefinable cleanup under the supervision of the Construction Manager. For example:
      i. 100 Man hours/wk = 2 hrs. Cleanup.
      ii. 200 Man hours/wk = 4 hrs. Cleanup.
      400 Man hours/wk = 8 hrs. Cleanup.
   C. Each Subcontractor will be responsible for providing broom(s) and necessary cleaning equipment (including sweeping compound) for their participant(s) in the cooperative clean ups.
   D. All Subcontractors failing to participate in the cooperative cleanup will be assessed a financial penalty equivalent to the number of man hours for which they are responsible at a rate of $80/hour. Subcontractors with tardy participants will be assessed a penalty of $80. The Construction Manager will supplement the labor for any Subcontractor failing to have a participant at the cooperative cleanup as required.
   E. The time and location of the cooperative cleanup will be arranged at the Weekly Contractor Meetings. Each Subcontractor will provide to the Construction Manager the names of their participant(s) for the cooperative cleanup.

6. HAZARDS CONTROL
   A. Store volatile wastes and any other hazardous wastes in covered metal containers, and remove from premises and legally dispose of these wastes daily.
   B. Prevent accumulation of wastes which create hazardous conditions.Provide adequate ventilation during use of volatile or noxious substances.
7. Conduct cleaning and disposal operation to comply with local ordinances and anti-pollution laws.
   A. Do not burn or bury rubbish and waste materials on project site.
   B. Do not dispose of volatile wastes (mineral spirits, oil, or paint thinner) or any other hazardous materials in storm or sanitary drains or in any other illegal fashion.
   C. Do not dispose of any wastes into streams or waterways.
8. Use only cleaning materials recommended by manufacturer of surface to be cleaned. The use of “Green Certified”, nonpolluting, low V.O.C. cleaning materials is required.
9. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.
10. Each Subcontractor shall perform their respective final clean up and shall leave the project in a clean, neat condition, prior to final acceptance of their work. Scheduling of final cleaning will be at the direction of the Construction Manager.
11. The following are examples, but do not define limits, of cleaning levels required:
    A. Remove labels which are not required as permanent labels. Clean all permanent labels.
    B. Clean reflecting and transparent materials, including mirrors and window/door glass to a polished condition, removing substances which are noticeable as vision obscuring materials. Replace broken glass and damaged reflecting and transparent materials.
    C. Clean exposed exterior and interior hard surfaced finishes, to a dirt free condition, free of dust, stains, films, and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflection condition.
    D. Wipe surfaces of mechanical and electrical equipment, ductwork, piping and raceways clean, including elevator equipment and similar equipment; remove excess lubrication and other substances.
    E. Remove debris and surface dust from limited access spaces including roofs, plenums above ceilings, shafts, chases, trenches, equipment vaults, manholes, attics, and similar spaces.
    F. Clean concrete floors in non-occupied spaces fine-broom clean.
    G. Vacuum clean carpeted surfaces and similar soft surfaces. Vacuum, mop, damp wipe and clean all finished hard surfaces.
    H. Clean plumbing fixtures to a sanitary condition, free of stains, including those resulting from water exposure.
    I. Clean light fixtures, lenses, and lamps so as to function with full efficiency.
    J. Clean project site (yard and grounds), including landscaped areas, of litter and foreign substances. Sweep paved areas to a broom clean condition; remove stains, chemical spills, and other foreign deposits by power-washing or as required to achieve a clean surface. Remove all erosion control systems, temporary fencing, and barricades and rake the areas smooth to provide

smooth regular transition to adjacent surfaces. Seed said transition area thereafter. Rake grounds, which are neither planted nor paved, to a smooth, even textured surface.

1.4. CONSTRUCTION WASTE MANAGEMENT

1. The Construction Manager shall provide and pay for dumpster type rubbish and recycling containers adequate for the project recyclables, waste, debris and rubbish for the life of the project for all Subcontractors, unless this work is specifically assigned to another trade contractor within their scope of work
2. If applicable, refer to the Construction Waste Management Plan for additional information on how recycled waste and discarded waste are to be handled, tracked, and documented. The responsibility for tracking and documentation will rest with the CM, or be assigned as a specific work category; every Subcontractor at the site is responsible to cooperate with the waste management plan. Every Subcontractor will plan their work to:
   A. Minimizes packaging and import of non-essential materials to the site
   B. Transport waste to the location(s) designated by the CM as a repository for waste and recyclables
   C. Compact or consolidate materials in the collection containers until removal from the site by others.
3. Recycling is required for all materials as designated by the Construction Manager, minimally: concrete, asphalt, masonry, cardboard, masonry, plastic, and metals.
4. No demolition material is allowed in the dumpster. Removal of demolition material from the site is the responsibility of the Subcontractor performing said demolition, and when stipulated, demolition debris must be recycled.

HOUSEKEEPING DIRECTIVE
FOR DEFINABLE DEBRIS

PROJECT: _____ DATE:_____

LOCATION: _____ PROJECT NO.: _____

TO: _____

The Michigan Occupational Safety and Health Act of 1991, Part 1, Paragraph R408.40119, Rule 119 requires that all projects be kept free from unnecessary debris. The Contract Documents (Section 01 7000) also state that you are required to remove your own debris daily and as directed by Granger Construction.

Accordingly, you are hereby directed to take the following Housekeeping Action.

_____

_____

_____

_____

_____

_____

_____

_____

If this directive is NOT satisfied by _____ at _____o'clock, the debris will be removed by others and all costs associated thereto will be deducted from your current partial payment due.

Thank you for your immediate cooperation.

By: _____
GRANGER CONSTRUCTION

Acknowledgment of Completion
Subcontractor:_____ Date: _____

Granger Construction _____ Date: _____

1.5. STARTING OF SYSTEMS

1. Coordinate schedule for start-up of various equipment and systems.
2. Notify Architect/Engineer seven days prior to start-up of each item.
3. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage. Record evidence and data.
4. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer. Record evidence and data.
5. Verify wiring and support components for equipment are complete and tested. Record evidence and data.
6. Execute start-up in accordance with manufacturer's instructions. Record evidence of full compliance with C, D, and E above, in a written start-up test report for each piece of equipment and for each system as a whole, within the O & M manual required in Section 01 7000.
7. Employ, and pay for services of an independent firm to perform testing, adjusting and balancing.
8. Adjust operating products and equipment to ensure smooth and unhindered operation, operating within tolerances/ranges and in full compliance with manufacturers printed operating instructions.
9. Provide manufacturers' printed instructions for start-up, adjusting, include description of equipment, method of operation and control including motors, pump units, signals, and special or non-standard features provided.
10. Provide schematic diagrams covering electrical equipment installed, including changes made in final work, with symbols listed corresponding to identity of markings on equipment.
11. Compile information as required by provisions of Section 01 7000.
12. Provide factory authorized representative training services to the Owner's designated personnel.

1.6. CLOSE-OUT PROCEDURES

1. Prior to requesting Architect/Engineer inspection for certification of Substantial Completion (for either entire Work or portions thereof), complete the following and list known exceptions in request:
   A. Provide certification that Work is substantially complete along with Subcontractor's punch list specifying incomplete items, reasons the Work is incomplete, by what date and what action is being taken to complete any open items.
   B. Advise Owner of pending insurance changeover requirements.
   C. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, agreements, final certifications, and similar documents.
   D. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including occupancy permits, final inspection certificates, Fire Marshal Affidavits, and similar releases**.**
   E. Deliver tools, spare parts, extra stocks of materials, and similar physical items to CM.
   F. Make final changeover of locks and transmit keys to CM and advise CM/Owner's personnel of changeover in security provisions.

G. Complete start up testing of systems and instructions of Owner's operating/maintenance personnel. Discontinue and remove from project site, temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.
H. Complete final cleaning requirements.

2. Prior to requesting Architect/Engineer inspection for close-out and certification of final payment, complete the following:
   A. Refer to Payment and Completion Article of Supplementary Conditions.
   B. Submit copy of Architect/Engineer final punch list of itemized work to be completed or corrected, certifying that each item has been completed or otherwise resolved for acceptance.
   C. Submit record drawings and similar final record information.
   D. Certification of code compliance.
   E. Submit certification stating that no materials containing asbestos were incorporated into the Work.
   F. Complete Granger Construction Company accounting department final close-out requirements including, but not limited to, final payment request, final waivers, release of all claims, and consent of bonding surety to final payment.

1.7. PUNCH LIST

1. Each Subcontractor shall prepare and keep their own room by room, item by item, detailed punch list on the job prior to the Architect/Construction Manager's preparation of a project punch list. This punch list is for use by their employees and subcontractors to facilitate completion of the Work. Subcontractor shall submit copy of punch list to Construction Manager within seven (7) days of request or substantial completion whichever is sooner and shall notify Construction Manager upon completion of work.
2. The Subcontractor's inspection shall be as thorough as possible, in accordance with their desire to provide first class workmanship and maintain good reputation and shall include all Work under their Contract, including that of their subcontractors.
3. The Architect and/or the Construction Manager shall observe the Work, providing Work on the Subcontractor's punch list has been completed, and prepare the Project Punch List, utilizing PlanGrid Issues, for use by the Subcontractors and their subcontractors to expedite proper completion of the Work.
4. Each Subcontractor must accomplish their initial and subsequent Project Punch List corrective items within fourteen (14) calendar days of notification of such work. Each Subcontractor shall notify the Construction Manager of their intended schedule to accomplish such Punch List items. If the Subcontractor, for any reason, does not expect to complete their work within this time frame, they shall notify the Construction Manager, in writing, within seven (7) days. On such notification, the Subcontractor must explain their reasons for such delay. Lack of response by the responsible Subcontractor in accomplishing such work will be cause for their work to be assigned to others and all costs expended shall be charged to that Subcontractor. In the interest of the Owner, and to accommodate other Subcontractors, the above procedure will be strictly enforced.

1.8. PROJECT RECORD DRAWINGS

1. Maintain within PlanGrid, the following record documents; record actual revisions to the Work:
   A. Contract Drawings.
   B. Specifications.
2. Store Record Documents separate from documents used for construction.
3. Each Subcontractor shall update "Project Record" drawings within PlanGrid using the Mark-up Tool. Drawings shall incorporate changes made in the Work of the respective trades during the construction period. Such changes shall be indicated at the time they occur.
4. Each Subcontractor also shall maintain one copy of specifications, addenda, approved shop drawings, change orders, field orders, other contract modifications, and other approved documents, product data and samples submitted by the Subcontractor, in compliance with various sections of the specifications.
5. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   A. Manufacturer's name and product model and number.
   B. Product substitutions or alternates utilized.
   C. Changes made by Addenda and Modifications.
6. Each of these project record documents shall be clearly marked "Project Record Copy"; maintained in good condition; available for observation by the Architect; and shall not be used for construction purposes. Mark up the document to show:
   A. Significant changes and selections made during the construction process; date each notation
   B. Significant detail not shown in the original Contract Documents including change orders;
   C. The physically measured location of underground utilities and appurtenances dimensionally referenced to permanent surface improvements;
   D. The location of internal utilities and appurtenances concealed in building structures, referenced to visible and accessible features of the structures;
   E. When elements are placed exactly as shown on Drawings, so indicate; otherwise show location and including dimensions of all elements whose location has changed from the design.
7. Prior to final payment on the Project, submit through the Construction Manager to the Architect the "Project Record" Drawings for changes recorded for the Work of Civil, Structural, Architectural (including Finishes and Elevations).
8. Prior to final completion, the Subcontractors for Mechanical Work and Electrical Work shall update their working drawings with changes made in their Work.
   A. Each drawing shall show final location routing of piping, ductwork (including size), conduits, circuitry, valves, operators, actuators, etc.

1.9. OPERATION AND MAINTENANCE MANUALS

1. Immediately upon receipt of approved shop drawings/product data, each Subcontractor shall submit to the Construction Manager an electronic copy of a comprehensive Maintenance and Operating Manual, presenting complete directions and recommendations for the proper care and maintenance

of visible surfaces as well as maintenance and operating instructions for equipment items which they has provided.

At a minimum, the Operation and Maintenance Manuals will contain:

A. Manual index cross referencing specification numbers for each item
B. Operating instructions
C. Emergency instructions
D. Spare parts list
E. Copies of warranties
F. Wiring diagrams
G. Recommended maintenance procedures and "turn around" cycles
H. Manual index cross referencing specification numbers for each item
I. Operating instructions
J. Emergency instructions
K. Spare parts list
L. Copies of warranties
M. Wiring diagrams
N. Recommended maintenance procedures and "turn around" cycles
O. Inspection and system-test procedures
P. Copies of applicable Shop Drawings
Q. Copies of applicable Product Data
R. Fixture lamping schedule
S. Maintenance drawings and diagrams
T. Listing of required maintenance materials
U. Precautions against improper maintenance
V. Names and addresses of nearest service outlets, distributors, or factory outlets for each piece of equipment.

2. Operating instructions shall include necessary printed directions for correct operations, adjustment, servicing, and maintenance of movable parts. Operating instructions must include complete integration of new systems with existing systems and how they are to operate together, in series, sequence, etc. Also included shall be suitable parts lists, approved shop drawings, and diagrams showing parts location and assembly.
3. Finished manuals shall be electronic documents with bookmarks identifying each particular portion or item of the Work.
4. For each titled item or work portion, manual must provide the names, addresses, and phone numbers of the following parties:
   A. Subcontractor/installer
   B. Manufacturer
   C. Nearest dealer/supplier
   D. Nearest agency capable of supplying parts and service
   E. Each electronic file shall indicate the following information on the first page.
   F. Project name and address

G. Owner's name
H. Name and address of Architect
I. Name and address of Construction Manager
J. Name and address of Subcontractor
K. Date of submission

1.10. OWNER TRAINING AND DEMONSTRATION

1. Owner Training shall minimally include a detailed review of the following items:
   A. Maintenance manuals
   B. Control sequences
   C. Record documents
   D. HazardsSpare parts and materials
   E. Cleaning
   F. Special Tools
   G. Warranties and bonds
   H. Lubricants
   I. Maintenance agreements & similar continuing commitments.
   J. Fuels
   K. Identification systems
2. As part of instruction for operating equipment, demonstrate the following procedures:
   A. Start-up
   B. Shutdown
   C. Emergency operations
   D. Noise and vibration adjustments
   E. Safety procedures
   F. Economy and efficiency adjustments
   G. Effective energy utilization

1.11. GUARANTEES AND WARRANTIES

1. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
   A. Refer to the Supplementary General Conditions for terms of the Subcontractor's special warranty of workmanship and materials.
   B. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Specification Divisions 2 through 33.
   C. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
2. Disclaimers and Limitations

A. Manufacturer's disclaimers and limitations on product warranties do not relieve the Subcontractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Subcontractor.

3. The Term "Warranty":
   A. As defined in the AIA "Glossary of Construction Industry Terms", May 1991 edition: "A warranty is a legally enforceable assurance of quality or performance of a product or Work, or the duration of satisfactory performance".
4. Standard Product Warranties:
   A. Standard Project Warranties are preprinted written warranties published by individual manufacturers for particular products and where indicted are specifically endorsed by the manufacturer to the Owner.
5. Special Warranties:
   A. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner. Refer to "Form of Special Warranty" elsewhere herein.
6. General Warranty Requirements and Guarantee Requirements
   A. All materials and workmanship provided under this contract shall be guaranteed and warranted for a period of not less than one year (unless specified for a different duration herein) to perform, function and appear as specified.
   B. Provide written guarantee covering all correction of work required by General Conditions and Supplementary Conditions. Also provide all special guarantees required per specification Divisions 2 through 33.
   C. Unless specifically stated otherwise in the specifications, the time period for all guarantees, warranties, etc., required by Contract Documents shall begin on date indicated for Certificate of Substantial Completion. If permanent equipment is to be used for temporary service (heating, cooling, ventilation, etc.) during construction, include in your base contract the purchase of extended warranty(ies**.**
   D. Subcontractor must review, endorse and countersign all written guarantees provided by their sub-subcontractors and/or material suppliers, and shall be fully bound to and obligated by all conditions thereof.
   E. Subcontractor shall submit letter to Construction Manager stating requirements to maintain warranty. Letter to include requirements of periodic inspections schedule by manufacturing representatives, notification process and common items that may void warranty
7. Related Damages and Losses:
   A. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
8. Reinstatement of Warranty:

A. When Work covered by a warranty has failed and has been corrected by replacement or building, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty.

9. Replacement Cost:
   A. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Subcontractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
10. Owner's Recourse:
   A. Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
11. Rejection of Warranties:
   A. The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
   B. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitment are willing to do so.
   C. In the event repairs become necessary, written notice will be given to the Subcontractor to make same. Failure of the Subcontractor to commence such repairs within 48 hours for environmental equipment, such as heating, air conditioning, air handling, water systems, and within 30 days for all other work, except as noted in specific sections; after such notice, the Owner/CM may make the repairs either by its own employees or by independent contract and may thereupon recover from the Subcontractor and its sureties, the cost of the repairs so made together with the cost of the supervision and inspection thereof. The Owner will have sixty (60) days after the expiration of said warranty period in which to notify the Subcontractor of any such repairs necessary on the date of such expiration. The determination of the necessity for repairs shall rest entirely with the Owner's Representative whose decision upon the matter shall be final and obligatory upon the Subcontractor.
   D. Warranty Issues will be assigned and tracked using PlanGrid Issues. All Subcontractors must maintain their PlanGrid subscription for the complete duration of the warranty period.
12. Submit sample warranty with all original submittals at the beginning of the project for review with product data as per Section 01 3300.
13. Submit final written warranties endorsed by the manufacturer and the Subcontractor to the Construction Manager prior to the date determined for Substantial Completion. These final written warranties will include all specific warranties, whether they are “special” or “standard”.
14. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Construction Manager.

15. When a special warranty is required to be executed by the Contractor, or the Contractor and subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Construction Manager for approval along with original submittal prior to final execution.
16. Form of Submittal:
    A. At Final Completion, compile electronic copies of each required warranty and bond properly executed by the Subcontractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
    B. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION