MICHIGAN STATE
UNIVERSITY

ELECTRONIC BIDDING

PUBLICLY BID AND ADVERTISED
SPECIFICATION FOR

STORM SEWER – RIVER OUTFALL STRUCTURAL REPAIRS TO STORM SEWER

PROJECT NUMBER

CP21037

Thursday, February 05, 2026

AT

MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN

Infrastructure Planning and Facilities
Planning, Design and Construction

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TABLE OF CONTENTS

DIVISION 29 – NATIVE RESTORATION

- 293600 NATIVES SEEDING

DIVISION 31 - EARTHWORK

- 311400 SITE CLEARING
- 312300 EARTHWORK
- 312319 DEWATERING
- 314100 SHORING AND UNDERPINING
- 314200 OUTFALL ANCHORING
    - PLATIPUS EARTH ANCHORING SYSTEMS BROCHURE

DIVISION 32 - EXTERIOR IMPROVEMENTS

- 321313 CONCRETE PAVEMENT
- 323119 ORNAMENTAL FENCES AND GATES
- 324000 SITE APPURTENANCES

DIVISION 33 - UTILITIES

- 334000 STORM DRAINAGE

SCHEDULE OF DRAWINGS

Project Title: **STORM SEWER – RIVER OUTFALL STRUCTURAL REPAIRS TO STORM SEWER**

Capital Project Number: **CP21037**

No. of Sheets: **15**

ADVERTISEMENT FOR BIDS

DATE: **February 6, 2026**

PROJECT TITLE: **STORM SEWER – RIVER OUTFALL STRUCTURAL REPAIRS TO STORM SEWER**

PROJECT NUMBER: **CP21037**

for

MICHIGAN STATE UNIVERSITY

located at

EAST LANSING, MICHIGAN

OWNER: BOARD OF TRUSTEES
MICHIGAN STATE UNIVERSITY

ENGINEER/ARCHITECT: PLANNING, DESIGN AND CONSTRUCTION
Infrastructure Planning and Facilities
Michigan State University

DESIGN REPRESENTATIVE: **Andy Linebaugh** **PHONE: 517-243-0029**

PROJECT MANAGER: **Andy Linebaugh** **PHONE: 517-243-0029**

BID DUE DATE: Until **3:00 p.m.** on **Thursday, February 26, 2026**, the Owner will receive bids for the work as set forth in the Bidding Documents at via the Owner's Oracle Primavera Unifier Bid Manager, at which time and place all proposals will be publicly opened. Bidders are responsible for properly registering for this process and familiarizing themselves with the system and its requirements. Registration information can be found at https://ipf.msu.edu/construction/partners/prospective-partners.

Proposals are invited for the following work:
Proposal 1 – General Construction Work

This project involves improvements to 8 different stormwater outlet headwalls that discharge into the Red Cedar River. More particularly, this project includes the following approximate quantities:

- 12" C76 IV RCP Storm Sewer 64 LF
- 18" C76 IV RCP Storm Sewer 32 LF
- 27" C76 IV RCP Storm Sewer 16 LF
- 12" Precast Outlet Headwall 4 EA
- 30" Precast Outlet Headwall 1 EA
- Riprap Over Geotextile Fabric, 8-12" 39 SYD
- Marmac Coupler, <18" 5 EA
- Marmac Coupler, >18" 2 EA
- Encase Pipe Joint in Concrete, <24" 6 EA
- Encase Pipe Joint in Concrete, >24" 1 EA
- Mortar Existing Pipe Joints 1 EA
- Remove Sediment Inside Pipe 1 CYD
- Remove Concrete Headwall 14.3 CYD
- Existing Headwall, Adj 2 EA
- Urbanite Retaining Wall Repair 1 LSUM
- Remove Storm Sewer, <24" 100 LF
- Remove Storm Sewer, >24" 16 LF
- Remove & Replace Fence, Chain Fence 40 LF
- Remove & Replace Concrete Sidewalk 100 SYD
- Remove & Reinstall Emergency Pedestal 1 LSUM
- 6-Inch Topsoil, Supplied by MSU, Placed by Contractor 796 SYD
- SESC, Silt Fence 360 LF
- SESC, Turbidity Curtain 400 LF
- Outlet Headwall Anchor 10 EA

Publicly Bid and Advertised: This project is publicly bid and advertised.

A construction start date is set for **May 4, 2026,** and the substantial construction completion date for the project, as set forth in the project manual and drawings is **August 21, 2026**. See applicable start date and interim completion dates in the General Requirements (Division One) – Part 1 Work Sequence section.

LIQUIDATED DAMAGES:
☐ Shall, or ☒ Shall not be assessed for Substantial Completion at:
$_____PER DAY

☐ Shall, or ☒ Shall not be assessed for Final Completion at:
$_____PER DAY

EXCLUSIONS FROM MUTUAL WAIVERS OF CONSEQUENTIAL DAMAGES:
DEFAULT IS NONE. (If exclusions apply, project team to insert applicable exclusions below).

_____

The complete set of documents is also available for viewing through our MSU Plan Room or via the MSU Planning, Design and Construction web page at https://ipf.msu.edu/construction/partners/prospective-partners and then select “dedicated plan room”.

PLAN ROOMS

The Bidding documents are on file and may be examined at the following locations during regular business hours, Monday through Friday:

Builders Exchange of Lansing &
Central Michigan
1240 East Saginaw
Lansing, MI 48906

Dodge Data & Analytics
25330 Telegraph Road, Suite 350
Southfield, MI 48009

Dodge Data & Analytics
914 E. Vine Street
Kalamazoo, MI 49001

Dodge Data & Analytics
1311 South Linden Road, Suite B
Flint, MI 48532

Builders Exchange
P.O. Box 2031
Grand Rapids, MI 49501

Tri-City Builders & Traders Exchange
334 South Water
Saginaw, MI 48607

Construction Association of Michigan
43636 Woodward Avenue
P. O. Box 3204
Bloomfield Hills, MI 48302-3204

Builders Exchange
3431 East Kilgore
Kalamazoo, MI 49001

CNS Construction News Service
of West Michigan, Inc.
1793 R. W. Berends Dr. SW.
Wyoming, MI 49509-4993

MMSDC Michigan Minority Supplier
Development Council.
100 River Place STE 300
Detroit, MI 48207

Builders Exchange of NW MI, Inc.
1373 Barlow St. , Suite 4
Traverse City, MI 49686

Capital Imaging
2521 East Michigan Avenue
Lansing, MI 48912

A pre-bid site inspection will be held on **Thursday, February 12, 2026** at **10:00 a.m.**. All interested Contractors or Bidders are encouraged to attend. Interested parties should meet at the **IPF Building, Conference Room 11 & 12, 1147 Chestnut Rd., East Lansing, MI 48824**. All Contractors submitting bids for the work will be held to have visited the site prior to submitting bids.

Each proposal shall be accompanied by a bid security as set forth in the Instructions to Bidders.

The Owner reserves the right to reject any or all proposals either in whole or in part and to waive any irregularities.

Withdrawal of any proposal is prohibited for a period of 120 days after the actual date of the opening thereof.

Performance and Labor and Material Bonds are required as set forth in the Instructions to Bidders.

All prospective Bidders, their Subcontractors and suppliers must be awardable by and in compliance with the directives and guidelines of the Contract Compliance Division of the Michigan Civil Rights Commission.

SUBCONTRACTING AND SUPPLIER DIVERSITY

The University makes a continuous effort to broaden its business relationships with Minority Business Enterprise (MBE) contractors, Women Business Enterprise (WBE) contractors, and small business concerns (including veteran-owned small business, service-disabled veteran owned small business, HUB Zone small business, and small disadvantaged business concerns certified by the U.S. Small Business Administration). For the purposes of this provision, suppliers are considered subcontractors. If third parties are needed to fulfill contractual obligations to the University, you are strongly encouraged to consider all qualified sources, including WBE, MBE, and small business subcontractors. For purposes of this paragraph, MBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by individuals who are members of a minority and with respect to which more than 50% of the net profit or loss attributable to the business accrues to shareholders who are members of a minority. WBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by women and with respect to which more than 50% of the net profit or loss attributable to the business accrues to the women shareholders.

The apparent Low Bidder shall, within 24 hours, after receipt of bids, provide the names of any MBE/WBE/small business subcontractors, description of work to be done by each, dollar value of work, and percentage of contract price. This information shall be included with the contract breakdown specified in Section 012000.1.4 of the specifications.

The Michigan State University Purchasing Department maintains a list of known Minority and Women Business Enterprises in the region for informational purposes. Bidders can obtain a copy of this list by calling (517) 355-0357. This list is not intended to be comprehensive. Similarly, it does not constitute an endorsement or certification of acceptability of the contractors and vendors included.

INSTRUCTION TO BIDDERS

ARTICLE 1

DEFINITIONS

1.1 Bidding Documents include the Advertisement or Invitation to Bid, Instruction to Bidders, the Bid Form, other sample bidding and Contract forms and the proposed Contract Documents including any Addenda issued prior to receipt of Bids.

1.2 All definitions set forth in ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU) and in other Contract Documents are applicable to the Bidding Documents.

1.3 **Addenda** are written or graphic instruments, issued by the Architect prior to the receipt of Bids, which modify or interpret the Bidding Documents by addition, deletions, clarifications or corrections.

1.4 A **Bid** is a complete and properly signed proposal to do the Work or designated portion thereof, for the sums stipulated therein, supported by data called for by the Bidding Documents.

1.5 **Base Bid** is the sum stated in the Bid for which the Bidder offers to perform the Work described as the base, to which Work may be added or deducted for sums stated in Alternate Bids.

1.6 An **Alternate Bid** (or Alternate) is an amount stated in the Proposal to be added to or deducted from the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.

1.7 A **Unit Price** is an amount stated in the Bid as a price per unit of measurement for materials or services as described in the Contract Documents.

1.8 A **Bidder** is one who submits a Bid for a prime Contract with the Owner for the Work described in the proposed Contract Documents.

1.9 A **Sub-bidder** is one who submits a Bid to a Bidder for materials or labor for a portion of the Work.

1.10 **Bid Manager** is the Oracle Primavera Unifier Bid Manager application used by the Owner to receive competitive bids for this project. The Bid Manager is an electronic platform.

ARTICLE 2

BIDDER'S REPRESENTATION

2.1 Each Bidder, by making his/her Bid, represents that:

2.1.1 They have read and understand the Bidding Documents and their Bid is made in accordance therewith.

2.1.2 They have visited the site and are familiar with the local conditions under which the Work is to be performed.

2.1.3 Their Bid is based upon the materials, systems and equipment described in the Bidding Documents, without exceptions.

ARTICLE 3

BIDDING DOCUMENTS

3.1 COPIES

3.1.1 Bidders may obtain complete sets of the Bidding Documents via the MSU Planning, Design and Construction web page at https://ipf.msu.edu/construction/partners/prospective-partners, or as outlined in the Advertisement for Bids, page AB-2.

3.1.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 The Owner or Architect, in making copies of the Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant for any other use.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.

3.2.2 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to be received by the Architect at least fourteen days prior to the date for receipt of Bids.

3.2.3 Any interpretation, correction or change of the Bidding Documents will be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

3.3.2 No substitution will be considered unless written request for approval has been submitted by the Bidder and has been received by the Architect at least fourteen days prior to the date for receipt of Bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data, and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It is the burden of the bidder proposing the substitution to establish its merits. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

3.3.3 If the Architect approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

3.4 ADDENDA

3.4.1 The Architect and Owner will endeavor to notify all known plan holders of addenda issued, but it is the Bidder's responsibility to verify receipt of all addenda.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 Normally Addenda will not be issued later than five 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.

3.4.4 Each Bidder shall ascertain prior to submitting their Bid that they have received all Addenda issued, and receipt of all Addenda shall be acknowledged on their bid.

ARTICLE 4

BIDDING PROCEDURE

4.1 FORM AND STYLE OF BIDS

4.1.1 Bidders will receive an invitation from Oracle Primavera Unifier to the Bid Manager.

4.1.2 Bids shall be submitted via the Bid Manager on the form specified.

4.1.3 All fields on the Bid Form shall be completed.

4.1.4 All requested Alternates shall be listed and quoted in the Bid Manager. Failure to quote a requested Alternate will be cause to reject the Bid.

4.1.4.1 If an alternate is added via Addendum, bidders will include by [adding new line to bid form, clearly labeling ALTERNATE X (x being the number)] or [providing pricing on an attachment, also clearly labeling pricing for Alternate.]

4.1.5 All requested Unit Prices shall be listed and quoted via attachment in the Bid Manager. Failure to quote a requested Unit Price will be cause to reject the Bid.

4.1.6 Acknowledge the receipt of the last Addendum on the Bid Form. By acknowledging this addendum, Bidder also acknowledges receipt of all prior consecutive addenda (e.g., acknowledging Addendum 3 also acknowledges Addendum 1 and 2).

4.1.7 Bidder shall make no additional stipulations on the Bid Form nor qualify its Bid in any manner.

4.1.8 By submitting a Bid via the Bid Manager, the Bidder has committed the offer to perform the Work. The Owner will rely on this document as properly signed by the Bidder. The Owner may rely on this commitment, including submitting a claim on the Bidder's Bid Bond if they fail to enter into a contract per the project manual.

4.2 BID SECURITY

4.2.1 Any base bid greater than $50,000 shall be accompanied by a Bid Security in the form of a bid bond made payable to the Board of Trustees, Michigan State University, in the amount of not less than five percent (5%) of the Base Bid, as a proposal guarantee, pledging that the Bidder will enter into a Contract with the Owner on the terms stated in its Bid, and will furnish bonds as described hereunder in Article 8 covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Bidder shall attach a scanned copy of the bid bond to the bid in Unifier Bid Manager.

As an alternative to a bid bond, Bidders may provide certified check, cashiers' check, or money order made payable to the Board of Trustees, Michigan State University, in the amount of not less than five percent (5%) of the Base Bid, to be delivered to MSU Infrastructure Planning and Facilities, 1147 Chestnut Road, Room 101, East Lansing, MI 48824. The proposal guarantee of Bidders under consideration will be returned immediately after approval of contracts by the Owner; those of all others will normally be returned upon request within 48 hours after bid opening.

Should the Bidder refuse to enter into a Contract or fail to furnish such bonds within 30 days of notification of intent to award, the amount of the Bid Security shall be forfeited to the Owner as liquidated damages, not as penalty.

4.2.2 The bonding firm must be listed on the current U.S. Department of Treasury Circular 570, rated A- or better by Best, and be licensed to do business in the State of Michigan. The bonds are to be made out to "Michigan State University, Board of Trustees."

4.2.3 The Owner will have the right to retain the Bid Security of Bidders under consideration until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

4.3 SUBMISSION OF BIDS

4.3.1 Bids shall be completed prior to the time and date for receipt of Bids indicated in the Advertisement or Invitation to Bid, or any extension thereof made by Addendum. Bids received after the time and date for receipt of Bids will not be considered.

4.3.2 Bidder shall assume full responsibility for timely delivery at location designated for receipt of Bids.

4.3.3 Oral, telephone, paper, or faxed Bids are invalid and will not receive consideration.

4.4 MODIFICATION OR WITHDRAWAL OF BID

4.4.1 A Bid may not be modified, withdrawn, or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and Bidder so agrees in submitting his/her Bid.

4.4.2 Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by withdrawing current Bid, and resubmitting within the Bid Manager.

4.4.3 Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

4.5 BIDDER REGISTRATION

4.5.1 The Owner will only receive Bids via the Bid Manager, which requires prior registration and invitation. The Bidder is responsible to familiarize itself with this system and request access in a timely manner.

4.5.2 The Owner will endeavor to maintain a list of all interested bidders and invite to all public bids. Bidders interested in being added to this list must register. Registration information can be found at https://ipf.msu.edu/construction/partners/prospective-partners.

4.5.3 Bidders are encouraged to continue to monitor projects via plan rooms and other advertising venues. They must express interest to bid on MSU projects by request at least 7 days prior to a bid opening. Owner takes no responsibility for inviting a bidder after that date.

ARTICLE 5

CONSIDERATION OF BIDS

5.1 OPENING OF BIDS

5.1.1 Unless stated otherwise in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be opened publicly and will be read aloud virtually via Zoom. A Zoom meeting link will be listed in the Bid Manager.

5.1.1.1 Unless stated otherwise in the Advertisement or Invitation to Bid, the Owner will endeavor to share bid results within 24 hours of opening.

5.1.1.2 The Owner will endeavor to stream the bid opening, and will share details in the bid invitation

5.2 REJECTION OF BIDS

5.2.1 The Owner shall have the right to reject any or all Bids.

5.3 ACCEPTANCE OF BID (AWARD)

5.3.1 The Owner shall have the right to waive any informality or irregularity in any Bid received.

5.3.2 If the University accepts any alternates, it will do so in the order representing the Owner's opinion of the best value to Michigan State University. The Owner shall be the sole judge of value. The low bidder will be determined on the basis of the sum of the base bid and the alternates accepted.

5.4 ACCEPTANCE OF CONTRACTOR AND SUBCONTRACTORS

5.4.1 Each portion of the Work shall be performed by an organization equipped and experienced to do the Work in each particular field, and no portion shall be reserved by the Contractor unless they are so equipped and experienced. Within 24 hours after the receipt of Bids, the successful Contractor shall submit a list of each Subcontractor proposed for each section of the Work. Subcontractors shall be satisfactory to the Owner. Unless authorized to the contrary in writing from the Owner, Subcontracts shall be awarded to the firms named in this list. Acceptance of the Bid does not imply approval of the Subcontractors subsequently named, but each Subcontractor shall be approved individually.

ARTICLE 6

QUALIFICATION OF CONTRACTORS

6.1 SUBMISSION OF QUALIFICATION STATEMENT

6.1.1 Bidders to whom award of a Contract is under consideration shall submit to the Architect upon his/her request, a properly executed Contractor's Qualification Statement, Consensus Docs 221 – Constructor's Statement of Qualifications for a Specific Project, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

6.2 NONDISCRIMINATION

6.2.1 In performing under this Contract, the Contractor agrees not to discriminate against any employee, or applicant for employment, with respect to hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height or weight, marital status or handicap. Subcontracts with each Subcontractor will contain a provision requiring nondiscrimination in employment, as herein specified. Any breach of this covenant may be regarded as a material breach of this Contract. The foregoing is included as a part of the University's institutional Affirmative Action/Equal Opportunity commitment.

6.3 APPROVED ASBESTOS ABATEMENT CONTRACTORS

6.3.1 The Department of Environmental Health and Safety (EHS) annually prequalifies asbestos abatement contractors to perform asbestos abatement work on Campus. Asbestos abatement work shall only be performed by one of the asbestos abatement contractors on the approved list. The current list is available from the PDC Project Representative, the Environmental Coordinator for EHS, and at https://ehs.msu.edu/enviro/asbestos/index.html.

ARTICLE 7

POST-BID INFORMATION

7.1 SUBMISSIONS

7.1.1 Unless waived by the Architect, the apparent low Bidder shall, within 24 hours after receiving bids, submit the following information to the Architect:

7.1.1.1 A designation of the Work to be performed by the Bidder with their own forces.

7.1.1.2 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the Work.

7.1.1.3 A list of names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for each division and/or major subdivision, for the Owner’s approval.

7.1.1.4 The names of the MBE/WBE and a description of work to be done by each, dollar value of Work and percentage of contract price.

7.1.1.5 List of representatives authorized to perform Unifier functions on behalf of the contractor using the Unifier New Company Request, available at Unifier System Vendor Information Form.

7.1.1.6 Certificate of Insurance demonstrating compliance with project requirements.

7.1.1.7 Criminal Background Check (CBC) demonstrating compliance with university requirements.

7.1.2 At the option of the Owner, the Bidder may be required to establish to the satisfaction of the Architect and the Owner the capability, reliability, and responsibility of the proposed Contractor and Subcontractors to furnish and perform the Work.

7.1.3 Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect.

ARTICLE 8

PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

8.1 OWNER'S RIGHT TO REQUIRE BONDS

8.1.1 Each Bidder under a proposal in which the base bid exceeds $50,000, shall include the premiums for furnishing a Performance Bond and also Labor Material Bond, each in the full amount of the proposal sum as specified in the Owner / Constructor Agreement.

8.1.2 The bonding firm must be listed on the current U.S. Department of Treasury Circular 570, rated A- or better by Best, and be licensed to do business in the State of Michigan. The bonds are to be made out to "Michigan State University, Board of Trustees."

8.1.3 In assuming assigned Subcontractor by the successful Bidder for general building work as specified, each assigned Subcontractor for each Subcontract shall reimburse the General Contractor his/her proportionate share of the premiums for bonds.

8.2 TIME OF DELIVERY AND FORM OF BONDS AND INSURANCE

8.2.1 The Bidder shall deliver two (2) copies of the required bonds and insurance to the Owner not later than the date of execution of the Contract.

8.2.2 The Bidder shall require the Attorney-In-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his/her Power of Attorney.

ARTICLE 9

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 FORM TO BE USED

9.1.1 The Agreement for the Work will be governed by the project manual, and by the terms and conditions of ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU).

9.1.2 If the project is under $250,000, an MSU Purchase Order will be used and the terms and conditions of ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU), will serve as the applicable General Conditions for administration of the Work.

9.1.3 If the project is over $250,000, the ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor will be used and the terms and conditions of that Agreement will be formalized through the execution of a Contract Finalization Form.

ARTICLE 10

APPLICATION FOR PAYMENT

10.1 FORM TO BE USED

10.1.1 Applications for Payment shall be submitted in Unifier in accordance with the Pay Apps (Pay Applications) business process. Refer to the MSU IPF website for more information.

ARTICLE 11

ELECTRONIC TRANSACTIONS

11.1 UNIFIER

11.1.1 The Owner reserves the right to require that any or all transactions and submissions be conducted and delivered electronically through Unifier, a web-based project management software system. Unifier functions on most popular web browsers. If the owner requires the use of Unifier, the owner will provide the necessary licenses for access to Unifier. The Owner requires new vendors and users to complete the initial Unifier Vendor Training program on how to use Unifier. To request access to the Unifier Vendor Training program, send an email to Unifier Support at ipf.sa.cpmshelp@msu.edu. Access to Unifier will be password restricted, and any proposal, acceptance, quote or other information submitted through Unifier through the use of a party's password shall be deemed to be the submission of such party and any proposal, acceptance, quote or other information in the submission shall be binding on such party as if such proposal, acceptance, quote or other information was in a writing signed by such party. Owner shall not be required to verify the validity of any such submission or inquire as to the authority of the user gaining access to Unifier through the use of a party's password. It is the responsibility of the vendor to verify compatibility of their systems with Unifier. For more information, see Unifier System Vendor Information Form.

11.2 CONTRACT EXECUTION

11.2.1 The Owner may choose to accept a scanned signed contract, provided through Unifier, as acceptance of the agreement. The Owner will rely on this document as properly signed by the Constructor.

ConsensusDocs® 200
STANDARD AGREEMENT AND GENERAL CONDITIONS BETWEEN OWNER AND CONSTRUCTOR
(Lump Sum Price)

GENERAL INSTRUCTIONS. These instructions are solely for the information and convenience of ConsensusDocs users, and are not a part of the document. Gray boxes indicate where you should click and type in your project information. The yellow shading is a Word default function that displays editable text and is not necessary for document completion. Shading can be turned off by going to the Review tab, select "Restrict Editing" button and uncheck "Highlight the regions I can edit". In Word 2003 you will find this option under the Tools tab, Options, Security tab, Protect Document button.

EMBEDDED INSTRUCTIONS are provided to help you complete the document. To display or hide instructions select the "¶" button under the "Home" tab to show all formatting marks. Instruction boxes are color coded as follows:

Red Boxes: Instructions for fields that are typically required to complete contract.
Blue Boxes: Instructions for fields that may or may not be required for a complete contract.
Green Boxes: Provide general instructions or ConsensusDocs Coalition Guidebook comments, which can be found at www.ConsensusDocs.org/guidebook.

ENDORSEMENT. This document was developed through a collaborative effort of organizations representing a wide cross-section of the design and construction industry. The organizations endorsing this document believe it represents a fair allocation of risk and responsibilities of all project participants.

Endorsing organizations recognize that this document must be reviewed and adapted to meet specific needs and applicable laws. This document has important legal and insurance consequences, and it is not intended as a substitute for competent professional services and advice. Consultation with an attorney and an insurance or surety adviser is strongly encouraged. Federal, State and Local laws may vary with respect to the applicability or enforceability of specific provisions in this document. CONSENSUSDOCS SPECIFICALLY DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. PURCHASERS ASSUME ALL LIABILITY WITH RESPECT TO THE USE OF THIS DOCUMENT, AND CONSENSUSDOCS AND ANY OF THE ENDORSING ORGANIZATIONS SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM SUCH USE. For additional information, please contact ConsensusDocs, 2300 Wilson Blvd, Suite 300, Arlington, VA 22201, 866-925-DOCS (3627), support@consensusdocs.org or www.ConsensusDocs.org.

ConsensusDocs® 200

STANDARD AGREEMENT AND GENERAL CONDITIONS BETWEEN OWNER AND CONSTRUCTOR
(Lump Sum Price)
MSU UPDATE January 5, 2017

TABLE OF ARTICLES

ARTICLE 1 AGREEMENT

Capital Project Number: [_____] Account Code: [_____]

This Agreement is made this [_____] day of [_____] in the year [_____],

by and between the

OWNER, **MICHIGAN STATE UNIVERSITY**

and the

CONSTRUCTOR, [_____]

Tax identification number (TIN) [_____]
Contractor License No., if applicable [_____]

for construction and services in connection with the following

PROJECT [_____]

Notice to the Parties shall be given at the above addresses.

The Design Professional is as specified in the specifications.

ARTICLE 2 GENERAL PROVISIONS

2.1 PARTIES' RELATIONSHIP AND ETHICS The Parties each agree to proceed with the Project on the basis of mutual trust, good faith, and fair dealing.

2.1.1 The Constructor shall furnish construction administration and management services and use the Constructor's diligent efforts to perform the Work in an expeditious manner consistent with the Contract Documents. The Parties shall each endeavor to promote harmony and cooperation among all Project participants.

2.1.2 The Constructor represents that it is an independent contractor and that in its performance of the Work it shall act as an independent contractor.

2.1.3 Neither the Constructor nor any of its agents or employees shall act on behalf of or in the name of the Owner except as provided in this Agreement or unless authorized in writing by the Owner's Representative.

2.2 ETHICS The Parties shall perform their obligations with integrity, ensuring at a minimum that each: (a) avoids conflicts of interest and promptly discloses any to the other Party; and (b) warrants that it has not and shall not pay or receive any contingent fees or gratuities to or from the other Party, including its agents, officers, and employees, Subcontractors or others for whom they may be liable, to secure preferential treatment.

2.3 DESIGN PROFESSIONAL The Owner, through its Design Professional, shall provide all architectural and engineering design services necessary for the completion of the Work, except as specified in the documents. . The Constructor shall not be required to provide professional services which constitute the practice of architecture or engineering except as otherwise provided in section 3.15.

2.3.1 The Owner shall obtain from the Design Professional either a license for Constructor and Subcontractors to use the design documents prepared by the Design Professional or ownership of the copyrights for such design documents, and shall indemnify and hold harmless the Constructor

against any suits or claims of infringement of any copyrights or licenses arising out of the use of the design documents for the Project.

2.3.2 The Drawings, Specifications and other documents prepared by the Design Professional and the Design Professional's consultants, and copies thereof furnished to the Constructor, are for use solely with respect to this Project. They are not to be used by the Constructor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Design Professional and the Design Consultant's consultants.
2.3.3

2.4 DEFINITIONS

2.4.1 “Agreement” means this ConsensusDocs 200 Standard Agreement and General Conditions Between Owner and Constructor, as modified, and exhibits and attachments made part of this agreement upon its execution.

2.4.1.1 The following exhibits are part of this Agreement: None; refer to Contract Documents.

2.4.2 “Business Day” means all Days, except weekends and official federal or state holidays where the Project is located.

2.4.3 A “Change Order” is a written order signed by the Owner and the Constructor after execution of this Agreement, indicating changes in the scope of the Work, the Contract Price, or Contract Time, including substitutions proposed by the Constructor and accepted by the Owner.

2.4.4 The “Contract Documents” consist of this Agreement, the existing Contract Documents listed in section 14.1, drawings, specifications, addenda issued and acknowledged prior to execution of this Agreement, information furnished by the Owner pursuant to subsection 3.13.4, and modifications issued in accordance with this Agreement.

2.4.5 “Contract Price” is the amount indicated in section 7.1 of this Agreement.

2.4.6 “Contract Time” is the period between the Date of Commencement and Final Completion.

2.4.7 The “Constructor” is the person or entity identified in ARTICLE 1 and includes the Constructor's Representative.

2.4.8 “Cost of the Work” means the costs and discounts specified in subsection 8.3.1.3.

2.4.9 “Date of Commencement” is as set forth in section 6.1.

2.4.10 “Day” means a calendar day.

2.4.11 “Defective Work” is any portion of the Work that does not conform to the Requirements of the Contract Documents.

2.4.12 “Design Professional” means the licensed architect or engineer, and its consultants, retained by the Owner to perform design services for the Project.

2.4.13 “Final Contract Completion” occurs on the date when the Constructor's obligations under this Agreement are complete and accepted by the Owner and final payment becomes due and payable.
2.4.14 “Laws” mean federal, state, and local laws, ordinances, codes, rules, and regulations applicable to the Work with which the Constructor must comply that are enacted as of the Agreement date.

2.4.15 “Construction Change Directive” is a change to the Work directed by the Owner pursuant to section 8.2.

2.4.16 A “Material Supplier” is a person or entity retained by the Constructor to provide material or equipment for the Work.

2.4.17 “Others” means other contractors/constructors, material suppliers, and persons at the Worksite who are not employed by the Constructor or Subcontractors.

2.4.18 “Overhead” means (a) payroll costs and other compensation of Constructor’s employees in the Constructor's principal and branch offices; (b) general and administrative expenses of the Constructor's principal and branch offices including charges against the Constructor for delinquent payments; and (c) the Constructor's capital expenses, including interest on capital used for the Work.

2.4.19 “Owner” is the person or entity identified in ARTICLE 1, and includes the Owner's Representative.

2.4.20 The “Parties” are collectively the Owner and the Constructor.

2.4.21 “The Project,” as identified in ARTICLE 1, is the building, facility, or other improvements for which the Constructor is to perform Work under this Agreement. It may also include construction by the Owner or Others.

2.4.22 The “Schedule of the Work” is the document prepared by the Constructor that specifies the dates on which the Constructor plans to begin and complete various parts of the Work, including dates on which information and approvals are required from the Owner.

2.4.23 A “Subcontractor” is a person or entity retained by the Constructor as an independent contractor to provide the labor, materials, equipment, or services necessary to complete a specific portion of the Work. The term Subcontractor does not include the Design Professional, or Others.

2.4.24 “Substantial Completion” of the Work, or of a designated portion, occurs on the date when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner may occupy or utilize the Project, or a designated portion, for the use for which it is intended, without unscheduled disruption. The issuance of a certificate of occupancy is not a prerequisite for Substantial Completion if the certificate of occupancy cannot be obtained due to factors beyond the Constructor's control. This date shall be confirmed by a Certificate of Substantial Completion signed by the Owner and Constructor.

2.4.25 A “Sub-subcontractor” is a person or entity who has an agreement with a Subcontractor or another Sub-subcontractor to perform a portion of the Subcontractor's Work.

2.4.26 “Terrorism” means a violent act, or an act that is dangerous to human life, property, or infrastructure, that is committed by an individual or individuals and that appears to be part of an effort to coerce a civilian population or to influence the policy or affect the conduct of any

government by coercion. Terrorism includes, but is not limited to, any act certified by the United States government as an act of terrorism pursuant to the Terrorism Risk Insurance Act, as amended.

2.4.27 “Work” means the construction and services necessary or incidental to fulfill the Constructor's obligations for the Project in conformance with this Agreement and the other Contract Documents. The Work may refer to the whole Project or only a part of the Project if work is also being performed by the Owner or Others.

2.4.28 “Worksite” means the geographical area of the Project location as identified in ARTICLE 1 where the Work is to be performed.

ARTICLE 3 CONSTRUCTOR'S RESPONSIBILITIES

3.1 GENERAL RESPONSIBILITIES

3.1.1 The Constructor shall provide all labor, materials, equipment, and services necessary to complete the Work, all of which shall be provided in full accord with and reasonably inferable from the Contract Documents.

3.1.2 The Constructor shall be responsible for the supervision and coordination of the Work, including the construction means, methods, techniques, sequences, and procedures utilized, unless the Contract Documents give other specific instructions. In such case, the Constructor shall not be liable to the Owner for damages resulting from compliance with such instructions unless the Constructor recognized and failed to timely report to the Owner any error, inconsistency, omission, or unsafe practice that it discovered in the specified construction means, methods, techniques, sequences, or procedures.

3.1.3 The Constructor shall perform Work only within locations allowed by the Contract Documents, Laws, and applicable permits.

3.2 COOPERATION WITH WORK OF OWNER AND OTHERS

3.2.1 The Owner may perform work at the Worksite directly or by Others. Any agreements with Others to perform construction or operations related to the Project shall include provisions pertaining to insurance, indemnification, waiver of subrogation, consequential damages, coordination, interference, cleanup, and safety that are substantively the same as the corresponding provisions of this Agreement.

3.2.2 If the Owner elects to perform work at the Worksite directly or by Others, the Constructor and the Owner shall coordinate the activities of all forces at the Worksite and agree upon fair and reasonable schedules and operational procedures for Worksite activities. The Owner shall require each separate contractor to cooperate with the Constructor and assist with the coordination of activities and the review of construction schedules and operations. The Contract Price and Contract Time shall be equitably adjusted, as mutually agreed by the Parties, for changes made necessary by the coordination of construction activities, and the Schedule of the Work shall be revised accordingly. The Constructor, the Owner, and Others shall adhere to the revised construction schedule.

3.2.3 With regard to the work of the Owner and Others, the Constructor shall (a) proceed with the Work in a manner that does not hinder, delay, or interfere with the work of the Owner or Others or

cause the work of the Owner or Others to become defective, (b) afford the Owner or Others reasonable access for introduction and storage of their materials and equipment and performance of their activities, and (c) coordinate the Constructor's Work with theirs.

3.2.4 Before proceeding with any portion of the Work affected by the construction or operations of the Owner or Others, the Constructor shall give the Owner prompt written notification of any defects the Constructor discovers in their work which will prevent the proper execution of the Work. The Constructor's obligations in this subsection do not create a responsibility for the work of the Owner or Others, but are for the purpose of facilitating the Work. If the Constructor does not notify the Owner of defects interfering with the performance of the Work, the Constructor acknowledges that the work of the Owner or Others is not defective and is acceptable for the proper execution of the Work. Following receipt of written notice from the Constructor of defects, the Owner shall promptly inform the Constructor what action, if any, the Constructor shall take with regard to the defects.

3.3 RESPONSIBILITY FOR PERFORMANCE

3.3.1 Prior to commencing the Work, the Constructor shall examine and compare the drawings and specifications with information furnished by the Owner that are Contract Documents, relevant field measurements made by the Constructor, and any visible conditions at the Worksite affecting the Work.

3.3.2 Should the Constructor discover any errors, omissions, or inconsistencies in the Contract Documents, the Constructor shall promptly report them to the Owner. It is recognized, however, that the Constructor is not acting in the capacity of a licensed design professional, and that the Constructor's examination is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions, or inconsistencies or to ascertain compliance with applicable laws, building codes, or regulations. Following receipt of written notice from the Constructor of defects, the Owner shall promptly inform the Constructor what action, if any, the Constructor shall take with regard to the defects.

3.3.3 The Constructor may be entitled to additional costs or time because of clarifications or instructions arising out of the Constructor's reports described in this section.

3.3.4 Nothing in this section shall relieve the Constructor of responsibility for its own errors, inconsistencies, and omissions.

3.4 CONSTRUCTION PERSONNEL AND SUPERVISION

3.4.1 The Constructor shall provide competent supervision for the performance of the Work. Before commencing the Work, the Constructor shall notify the Owner in writing of the name and qualifications of its proposed superintendent(s) and project manager so the Owner may review the individual's qualifications. If, for reasonable cause, the Owner refuses to approve the individual, or withdraws its approval after once giving it, the Constructor shall name a different superintendent or project manager for the Owner's review. Any disapproved superintendent shall not perform in that capacity thereafter at the Worksite.

3.4.2 The Constructor shall be responsible to the Owner for acts or omissions of parties or entities performing portions of the Work for or on behalf of the Constructor or any of its Subcontractors.

3.4.3 The Constructor shall permit only qualified persons to perform the Work. The Constructor shall enforce safety procedures, strict discipline, and good order among persons performing the Work. If the Owner determines that a particular person does not follow safety procedures, or is unfit or

unskilled for the assigned Work, the Constructor shall immediately reassign the person upon receipt of the Owner's written notice to do so.

3.4.4 CONSTRUCTOR'S REPRESENTATIVE The Constructor's authorized representative is [_____]. The Constructor's Representative shall possess full authority to receive instructions from the Owner and to act on those instructions. If the Constructor changes its representative or their authority, the Constructor shall immediately notify the Owner in writing. Any such change shall be approved by the Owner. Such Owner approval shall not be unreasonably withheld.

3.4.5 The Constructor shall supervise and direct the Work, using the Constructor's best skill and attention. The Constructor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Constructor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Constructor determines that such means, methods, techniques, sequences or procedures may not be safe, the Constructor shall give timely written notice to the Owner and Design Professional and shall not proceed with that portion of the Work without further written instructions from the Design Professional. If the Constructor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Constructor, the Owner shall be solely responsible for any resulting loss or damage.

3.4.6 The Constructor shall (1) review any specified construction or installation procedure (including those recommended by manufacturers); (2) advise the Design Professional (a) if a specified procedure deviates from good construction practice or (b) if following the procedure will affect any warranties, including the Constructor’s general warranty; and (3) propose any alternative procedure which the Contract will warrant.

3.5 WORKMANSHIP The Work shall be executed in accordance with the Contract Documents in a workmanlike manner. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except such materials as may be expressly provided in the Contract Documents to be otherwise.

3.6 MATERIALS FURNISHED BY THE OWNER OR OTHERS If the Work includes installation of materials or equipment furnished by the Owner or Others, it shall be the responsibility of the Constructor to examine the items so provided and thereupon handle, store, and install the items, unless otherwise provided in the Contract Documents, with such skill and care as to provide a satisfactory and proper installation. Loss or damage due to acts or omissions of the Constructor shall be the responsibility of the Constructor and may be deducted from any amounts due or to become due the Constructor. Any defects discovered in such materials or equipment shall be reported at once to the Owner. Following receipt of written notice from the Constructor of defects, the Owner shall promptly inform the Constructor what action, if any, the Constructor shall take with regard to the defects.

3.7 TESTS AND INSPECTIONS

3.7.1 The Constructor shall schedule all required tests, approvals, and inspections of the Work or portions thereof at appropriate times so as not to delay the progress of the Work or other work related to the Project. The Constructor shall give proper notice to all required parties of such tests, approvals, and inspections. If feasible, the Owner and Others may timely observe the tests at the

normal place of testing. Except as provided in subsection 3.7.3, the Constructor shall bear all expenses associated with tests, inspections, and approvals required by the Contract Documents, which, unless otherwise agreed to, shall be conducted by an independent testing laboratory or entity retained by the Owner. Unless otherwise required by the Contract Documents, required certificates of testing, approval, or inspection shall be secured by the Constructor and promptly delivered to the Owner.

3.7.2 If the Owner or appropriate authorities determine that tests, inspections, or approvals in addition to those required by the Contract Documents will be necessary, the Constructor shall arrange for the procedures and give timely notice to the Owner and Others who may observe the procedures. Costs of the additional tests, inspections, or approvals are at the Owner's expense except as provided in the subsection below.

3.7.3 If the procedures described in the two subsections immediately above indicate that portions of the Work fail to comply with the Contract Documents, the Constructor shall be responsible for costs of correction and retesting.

3.8 WARRANTY

3.8.1 The Constructor warrants that all materials and equipment shall be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. At the Owner's request, the Constructor shall furnish satisfactory evidence of the quality and type of materials and equipment furnished. The Constructor further warrants that the Work shall be free from material defects not intrinsic in the design or materials required in the Contract Documents. The Constructor's warranty does not include remedies for defects or damages caused by normal wear and tear during normal usage, use for a purpose for which the Project was not intended, improper or insufficient maintenance, modifications performed by the Owner or Others, or abuse. The Constructor's warranty shall commence on the Date of Final Payment or Date of Certificate of Substantial Completion of the Work.

3.8.2 To the extent products, equipment, systems, or materials incorporated in the Work are specified and purchased by the Owner; they shall be covered exclusively by the warranty of the manufacturer. There are no warranties which extend beyond the description on the face of any such warranty.

3.8.3 The Constructor shall obtain from its Subcontractors and Material Suppliers any special or extended warranties required by the Contract Documents. All such warranties shall be listed in an attached exhibit to this Agreement. The Constructor's liability for such warranties shall be limited to the one-year correction period as provided in the section below. After that period, the Constructor shall provide reasonable assistance to the Owner in enforcing the obligations of Subcontractors or Material Suppliers for such extended warranties.

3.9 CORRECTION OF WORK WITHIN ONE YEAR

3.9.1 If, prior to Substantial Completion and within one year after the date of Substantial Completion of the Work, any Defective Work is found, the Owner shall promptly notify the Constructor in writing. Unless the Owner provides written acceptance of the condition, the Constructor shall promptly correct the Defective Work at its own cost and time and bear the expense of additional services required for correction of any Defective Work for which it is responsible. If within the one-year correction period the Owner discovers and does not promptly notify the Constructor or give the Constructor an opportunity to test or correct Defective Work as reasonably requested by the Constructor, the Owner waives the Constructor's obligation to correct that Defective Work as well as the Owner's right to claim a breach of the warranty with respect to that Defective Work.

3.9.2 With respect to any portion of Work first performed after Substantial Completion, the one-year correction period shall be extended by the period of time between Substantial Completion and the actual performance of the later Work. Correction periods shall not be extended by corrective work performed by the Constructor.

3.9.3 If the Constructor fails to correct Defective Work within a reasonable time after receipt of written notice from the Owner prior to final payment, the Owner may correct it in accordance with the Owner's right to carry out the Work. In such case, an appropriate Change Order shall be issued deducting the cost of correcting the Defective Work from payments then or thereafter due the Constructor. If payments then or thereafter due the Constructor are not sufficient to cover such amounts, the Constructor shall pay the difference to the Owner.

3.9.4 The Constructor's obligations and liability, if any, with respect to any Defective Work discovered after the one-year correction period shall be determined by the Law. If, after the one-year correction period but before the applicable limitation period has expired, the Owner discovers any Work which the Owner considers Defective Work, the Owner shall, unless the Defective Work requires emergency correction, promptly notify the Constructor and allow the Constructor an opportunity to correct the Work if the Constructor elects to do so. If the Constructor elects to correct the Work, it shall provide written notice of such intent within fourteen (14) Days of its receipt of notice from the Owner and shall complete the correction of Work within a mutually agreed timeframe. If the Constructor does not elect to correct the Work, the Owner may have the Work corrected by itself or Others, and, if the Owner intends to seek recovery of those costs from the Constructor, the Owner shall promptly provide the Constructor with an accounting of the correction costs it incurs.

3.9.5 If the Constructor's correction or removal of Defective Work causes damage to or destroys other completed or partially completed Work or existing buildings, the Constructor shall be responsible for the cost of correcting the destroyed or damaged property.

3.9.6 The one-year period for correction of Defective Work does not constitute a limitation period with respect to the enforcement of the Constructor's other obligations under the Contract Documents.

3.9.7 Prior to final payment, at the Owner's option and with the Constructor's agreement, the Owner may elect to accept Defective Work rather than require its removal and correction. In such case, the Contract Price shall be equitably adjusted for any diminution in the value of the Project caused by such Defective Work.

3.10 CORRECTION OF COVERED WORK

3.10.1 On request of the Owner, Work that has been covered without a requirement that it be inspected prior to being covered may be uncovered for the Owner's inspection. The Owner shall pay for the costs of uncovering and replacement if the Work proves to be in conformance with the Contract Documents, or if the defective condition was caused by the Owner or Others. If the uncovered Work proves to be defective, the Constructor shall pay the costs of uncovering and replacement.

3.10.2 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

3.10.3 If, contrary to specific requirements in the Contract Documents or contrary to a specific request from the Owner, a portion of the Work is covered, the Owner, by written request, may require the Constructor to uncover the Work for the Owner's observation. In this circumstance, the Work shall be replaced at the Constructor's expense and with no adjustment to the Contract Time.

3.11 SAFETY OF PERSONS AND PROPERTY

3.11.1 SAFETY PRECAUTIONS AND PROGRAMS The Constructor shall have overall responsibility for safety precautions and programs in the performance of the Work. However, such obligation does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work or for compliance with Laws The Constructor, all Subcontractors and all Sub-subcontractors shall require and provide training for all employees assigned to perform work under the Project, including any required OSHA/MIOSHA training. The training shall be appropriate to the work to be performed by such employees. The Constructor shall also ensure that all persons performing work on the Project are properly licensed for the tasks assigned to them.

3.11.2 . Possession, sale or consumption of alcoholic beverages on University construction sites is prohibited. The unlawful manufacture, distribution, dispensation, possession, or use of drugs and narcotics is prohibited on any property under the control of and governed by the Board of Trustees of Michigan State University and at sites where the work is performed by individuals on behalf of MSU. The Constructor shall take reasonable steps to ensure all persons performing work are drug and alcohol free on the job site.

3.11.3 The Constructor shall seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect:

3.11.3.1 its employees and other persons at the Worksite;

3.11.3.2 materials and equipment stored at onsite or offsite locations for use in the Work; and

3.11.3.3 property located at the Worksite and adjacent to Work areas, whether or not the property is part of the Worksite.

3.11.4 CONSTRUCTOR'S SAFETY REPRESENTATIVE The Constructor's Worksite safety representative is as specified on the contractor’s bid form, who shall act as the Constructor's Worksite safety representative with a duty to prevent accidents. If no individual is identified in this subsection, the Constructor’s safety representative shall be the Constructor's Representative. The Constructor shall report promptly in writing to the Owner all recordable accidents and injuries occurring at the Worksite. When the Constructor is required to file an accident report with a public authority, the Constructor shall furnish a copy of the report to the Owner.

3.11.5 The Constructor shall provide the Owner with copies of all notices required of the Constructor by law or regulation. The Constructor's safety program shall comply with the requirements of governmental and quasi-governmental authorities having jurisdiction.

3.11.6 Damage or loss not insured under property insurance which may arise from the Work, to the extent caused by the negligent acts or omissions of the Constructor, or anyone for whose acts the Constructor may be liable, shall be promptly remedied by the Constructor.

3.11.7 If the Owner deems any part of the Work or Worksite unsafe, the Owner, without assuming responsibility for the Constructor's safety program, may require the Constructor to stop performance

of the Work or take corrective measures satisfactory to the Owner, or both. If the Constructor does not adopt corrective measures, the Owner may perform them and deduct their cost from the Contract Price. The Constructor agrees to make no claim for damages, for an increase in the Contract Price or for a change in the Contract Time based on the Constructor's compliance with the Owner's reasonable request.

3.12 EMERGENCIES

3.12.1 In an emergency affecting the safety of persons or property, the Constructor shall act in a reasonable manner to prevent threatened damage, injury, or loss. Any change in the Contract Price or Contract Time resulting from the actions of the Constructor in an emergency situation shall be determined as provided for in ARTICLE 8.

3.13 HAZARDOUS MATERIALS

3.13.1 A Hazardous Material is any substance or material identified now or in the future as hazardous under Laws, or any other substance or material that may be considered hazardous or otherwise subject to statutory or regulatory requirement governing handling, disposal, or cleanup. The Constructor shall not be obligated to commence or continue work until any Hazardous Material discovered at the Worksite has been removed, rendered, or determined to be harmless by the Owner as certified by an independent testing laboratory and approved by the appropriate governmental agency.

3.13.2 If after commencing the Work, Hazardous Material is discovered at the Worksite, the Constructor shall be entitled to immediately stop Work in the affected area. The Constructor shall promptly report the condition to the Owner, the Design Professional, and, if required, the governmental agency with jurisdiction.

3.13.3 The Constructor shall not be required to perform any Work relating to or in the area of Hazardous Material without written mutual agreement.

3.13.4 The Owner shall be responsible for retaining an independent testing laboratory to determine the nature of the material encountered and whether the material requires corrective measures or remedial action. Such measures shall be the sole responsibility of the Owner, and shall be performed in a manner minimizing any adverse effect upon the Work. The Constructor shall resume Work in the area affected by any Hazardous Material only upon written agreement between the Parties after the Hazardous Material has been removed or rendered harmless and only after approval, if necessary, of the governmental agency with jurisdiction.

3.13.5 If the Constructor incurs additional costs or is delayed due to the presence or remediation of Hazardous Material, the Constructor shall be entitled to an equitable adjustment in the Contract Price or the Contract Time.

3.13.6 To the extent permitted by section 6.6 and to the extent not caused by the negligent acts or omissions of the Constructor, its Subcontractors and Sub-subcontractors, and the agents, officers, directors, and employees of each of them, the Owner shall defend, indemnify, and hold harmless the Constructor, its Subcontractors and Sub-subcontractors, and the agents, officers, directors, and employees of each of them, from and against all claims, damages, losses, costs, and expenses, including but not limited to reasonable attorneys' fees, costs, and expenses incurred in connection with any dispute resolution process, arising out of or relating to the performance of the Work in any area affected by Hazardous Material.

3.13.7 MATERIALS BROUGHT TO THE WORKSITE

3.13.7.1 Material Safety Data (MSD) sheets as required by law and pertaining to materials or substances used or consumed in the performance of the Work, whether obtained by the Constructor, Subcontractors, the Owner, or Others, shall be maintained at the Worksite by the Constructor and made available to the Owner, Subcontractors, and Others.

3.13.7.2 The Constructor shall be responsible for the proper delivery, handling, application, storage, removal, and disposal of all materials and substances brought to the Worksite by the Constructor and its Subcontractors and Sub-Subcontractors in accordance with the Contract Documents and used or consumed in the performance of the Work.

3.13.7.3 To the extent caused by the negligent acts or omissions of the Constructor, its agents, officers, directors, and employees, the Constructor shall indemnify and hold harmless the Owner, its agents, officers, directors, and employees, from and against any and all claims, damages, losses, costs, and expenses, including but not limited to attorneys' fees, costs, and expenses incurred in connection with any dispute resolution procedure, arising out of or relating to the delivery, handling, application, storage, removal, and disposal of all materials and substances brought to the Worksite by the Constructor and its Subcontractors and Sub-Subcontractors in accordance with the Contract Documents.

3.13.8 Section 3.13 shall survive the completion of the Work or any termination of this Agreement.

3.14 SUBMITTALS

3.14.1 The Constructor shall submit to the Owner and the Design Professional all shop drawings, samples, product data, and similar submittals required by the Contract Documents for review and approval. Submittals shall be submitted in electronic form if required in accordance with the Owner's Unifier project management system and subsection 4.4.1. The Constructor shall be responsible for the accuracy and conformity of its submittals to the Contract Documents. At no additional cost, the Constructor shall prepare and deliver its submittals in a manner consistent with the Schedule of the Work and in such time and sequence so as not to delay the performance of the Work or the work of the Owner and Others. Constructor submittals shall identify in writing for each submittal all changes, deviations, or substitutions from the requirements of the Contract Documents. The approval of any Constructor submittal shall not be deemed to authorize changes, deviations or substitutions from the requirements of the Contract Documents unless express written approval is obtained from the Owner specifically authorizing such deviation, substitution or change prior to submitting the item(s). To the extent a change, deviation or substitution causes an impact to the Contract Price or Contract Time, such approval shall be promptly memorialized in a Change Order. Neither the Design Professional nor Owner shall make any change, deviation or substitution through the submittal process without specifically identifying and authorizing such deviation to the Constructor. If the Contract Documents do not contain submittal requirements pertaining to the Work, the Constructor agrees upon request to submit in a timely fashion to the Design Professional and the Owner for review any shop drawings, samples, product data, manufacturers' literature or similar submittals as may reasonably be required by the Owner.

3.14.2 The Owner shall be responsible for review and approval of submittals with reasonable promptness to avoid causing delay.

3.14.3 The Constructor shall perform all Work strictly in accordance with approved submittals. Approval of shop drawings is not an authorization to perform changed work, unless the procedures of ARTICLE 8 are followed. Approval does not relieve the Constructor from responsibility for Defective Work resulting from errors or omissions on the approved shop drawings.

3.14.4 Record copies of the following, incorporating field changes and selections made during construction, shall be maintained at the Worksite and available to the Owner upon request: drawings, specifications, addenda, Change Order and other modifications, and required submittals including product data, samples and shop drawings.

3.14.5 No substitutions shall be made in the Work unless permitted in the Contract Documents and then only after the Constructor obtains approvals required under the Contract Documents for substitutions. All such substitutions shall be promptly memorialized in a Change Order following approval by the Owner and, if applicable, the Design Professional to provide for an adjustment in the Contract Price or Contract Time.

3.14.6 The Constructor shall prepare and submit to the Owner

final marked-up as-built drawings; and

updated electronic data, in accordance with subsection4.4.1; and other documentation as called for in project specifications.

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3.15 DESIGN DELEGATION If the Contract Documents specifically require the Constructor to procure design services, the Owner shall specify all required performance and design criteria. The Constructor shall not be responsible for the adequacy of such performance and design criteria. As permitted by the laws, rules, and regulations in the jurisdiction where the Project is located, the Constructor shall procure such services and any certifications necessary to satisfactorily complete the Work from a licensed design professional. The signature and seal of the Constructor's design professional shall appear on all drawings, calculations, specifications, certifications, shop drawings, and other submittals related to the Work designed or certified by Constructor's design professional.

3.16 WORKSITE CONDITIONS

3.16.1 WORKSITE VISIT The Constructor acknowledges that it has visited, or has had the opportunity to visit, the Worksite to visually inspect the general and local conditions which could affect the Work.

3.16.2 CONCEALED OR UNKNOWN SITE CONDITIONS If the conditions encountered at the Worksite are (a) subsurface or other physical conditions materially different from those indicated in the Contract Documents, or (b) unusual and unknown physical conditions materially different from conditions ordinarily encountered and generally recognized as inherent in Work provided for in the Contract Documents, the Constructor shall stop affected Work after the condition is first observed and give prompt written notice of the condition to the Owner and the Design Professional. The Constructor shall not be required to perform any Work relating to the unknown condition without the written mutual agreement of the Parties. Any change in the Contract Price or the Contract Time as a result of the unknown condition shall be determined as provided in ARTICLE 8.

3.17 PERMITS AND TAXES

3.17.1 The Constructor shall give public authorities all notices required by law and, except for permits and fees that are the responsibility of the Owner, shall obtain and pay for all necessary permits, licenses, and renewals pertaining to the Work. The Constructor shall provide to the Owner copies of all notices, permits, licenses, and renewals required under this Agreement.

3.17.2 The Constructor shall pay all applicable taxes enacted when bids are received or negotiations concluded for the Work provided by the Constructor.

3.17.3 If, in accordance with the Owner's direction, the Constructor claims an exemption for taxes, the Owner shall indemnify and hold the Constructor harmless from any liability, penalty, interest, fine, tax assessment, attorneys' fees, or other expense or cost incurred by the Constructor as a result of any such action.

3.18 CUTTING, FITTING, AND PATCHING

3.18.1 The Constructor shall perform cutting, fitting and patching necessary to coordinate the various parts of the Work and to prepare its Work for the work of the Owner or Others.

3.18.2 Cutting, patching or altering the work of the Owner or Others shall be done with the prior written approval of the Owner. Such approval shall not be unreasonably withheld.

3.19 CLEANING UP

3.19.1 The Constructor shall regularly remove debris and waste materials at the Worksite resulting from the Work. Prior to discontinuing Work in an area, the Constructor shall clean the area and remove all rubbish and its construction equipment, tools, machinery, waste, and surplus materials. The Constructor shall minimize and confine dust and debris resulting from construction activities. At the completion of the Work, the Constructor shall remove from the Worksite all construction equipment, tools, surplus materials, waste materials, and debris.

3.19.2 If the Constructor fails to commence compliance with cleanup duties within two (2) Business Days after written notification from the Owner of non-compliance, the Owner may implement appropriate cleanup measures without further notice and shall deduct the reasonable costs from any amounts due or to become due the Constructor in the next payment period.

3.20 ACCESS TO WORK The Constructor shall facilitate the access of the Owner, Design Professional, and Others to Work in progress.

3.21 COMPLIANCE WITH LAWS The Constructor shall comply with all Laws at its own costs. The Constructor shall be liable to the Owner for all loss, cost, or expense attributable to any acts or omissions by the Constructor, its employees, subcontractors, and agents for failure to comply with Laws, including fines, penalties, or corrective measures. However, liability under this subsection shall not apply if notice to the Owner was given, and advance approval by appropriate authorities, including the Owner, is received.

3.21.1 The Contract Price or Contract Time shall be equitably adjusted by Change Order for additional costs resulting from any changes in Laws, including increased taxes, which were not reasonably anticipated and then enacted after the date of this Agreement.

ARTICLE 4 OWNER'S RESPONSIBILITIES

4.1 INFORMATION AND SERVICES Owner’s responsibilities under this article shall be fulfilled with reasonable detail and in a timely manner.

4.2 WORKSITE INFORMATION To the extent the Owner has obtained, or is required elsewhere in the Contract Documents to obtain, the following Worksite information, the Owner shall provide at the Owner's expense and with reasonable promptness:

4.2.1 information describing the physical characteristics of the Worksite, including surveys, Worksite evaluations, legal descriptions, data or drawings depicting existing conditions, subsurface

conditions, and environmental studies, reports, and investigations. Legal descriptions shall include easements, title restrictions, boundaries, and zoning restrictions. Worksite descriptions shall include existing buildings and other construction and all other pertinent Worksite conditions. Adjacent property descriptions shall include structures, streets, sidewalks, alleys, and other features relevant to the Work. Utility details shall include available services, lines at the Worksite and adjacent thereto, and connection points. The information shall include public and private information, subsurface information, grades, contours, and elevations, drainage data, exact locations and dimensions, and benchmarks that can be used by the Constructor in laying out the Work.;

4.2.2 tests, inspections, and other reports dealing with environmental matters, Hazardous Material and other existing conditions, including structural, mechanical, and chemical tests, required by the Contract Documents or by Law; and

4.2.3 any other information or services requested in writing by the Constructor which are required for the Constructor's performance of the Work and under the Owner's control.

4.3 BUILDING PERMIT, FEES, AND APPROVALS Except for those permits and fees related to the Work which are the responsibility of the Constructor, the Owner shall secure and pay for all other permits, approvals, easements, assessments, and fees required for the development, construction, use or occupancy of permanent structures or for permanent changes in existing facilities, including the building permit.

4.4 CONTRACT DOCUMENTS Unless otherwise specified, the Owner shall provide zero) hard copies of the Contract Documents to the Constructor without cost.

4.4.1 DOCUMENTS IN ELECTRONIC FORM Project document exchange and submittals will be managed through the Owner’s Unifier project management system.

4.5 OWNER'S REPRESENTATIVE The Owner's Representative is stipulated in the Advertisement for Bids. The Owner’s Representative shall be fully acquainted with the Project, and shall have authority to bind the Owner in all matters requiring the Owner's approval, authorization or written notice. If the Owner changes its Representative or its Representative's authority, the Owner shall immediately notify the Constructor in writing.

4.6 OWNER'S CUTTING AND PATCHING Cutting, patching, or altering the Work by the Owner or Others shall be done with the prior written approval of the Constructor, which approval shall not be unreasonably withheld.

4.7 OWNER'S RIGHT TO CLEAN UP In case of a dispute between the Constructor and Others with regard to respective responsibilities for cleaning up at the Worksite, the Owner may implement appropriate cleanup measures after two (2) Business Days' notice and allocate the cost among those responsible during the following pay period.

4.8 COST OF CORRECTING DAMAGED OR DESTROYED WORK With regard to damage or loss attributable to the acts or omissions of the Owner or Others and not to the Constructor, the Owner may either (1) promptly remedy the damage or loss or (2) accept the damage or loss. If the Constructor incurs additional costs or is delayed due to such loss or damage, the Constructor shall be entitled to an equitable adjustment in the Contract Price or Contract Time.

ARTICLE 5 SUBCONTRACTS

5.1 SUBCONTRACTORS The Work not performed by the Constructor with its own forces shall be performed by Subcontractors.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Promptly after the bid opening and prior to award of this Agreement, the Constructor shall provide the Owner and, if directed, the Design Professional with a written list of the proposed Subcontractors and significant Material suppliers. If the Owner has a reasonable objection to any proposed Subcontractor or Material supplier, the Owner shall notify the Constructor in writing. Failure to promptly object shall constitute acceptance.

5.2.2 If the Owner has reasonably and promptly objected, the Constructor shall not contract with the proposed Subcontractor or Material supplier, and the Constructor shall propose another acceptable Subcontractor or Material Supplier to the Owner. An appropriate Change Order shall reflect any increase or decrease in the Contract Price or Contract Time because of the substitution. The Constructor shall not be required to contract with anyone to whom the Constructor has made a reasonable objection.

5.2.3 Before any person, including a sole proprietor operating under an assumed name, becomes a Subcontractor, or Sub-subcontractor, or performs any Work, Constructor shall deliver to Owner the information required by Parts II, III and IV of IRS Form SS-8 with respect to such person.

5.2.4 The Constructor may not use Subcontractors and shall not permit the use of Sub-subcontractors who have been dis-qualified from participating in Federal or State assisted contracts under existing Federal or State laws and regulations.

5.2.5 The Constructor shall not change a Sub-contractor, Sub-subcontractor, person or entity previously selected without the prior written approval of the Owner.

5.3 BINDING OF SUBCONTRACTORS AND MATERIAL SUPPLIERS The Constructor agrees to bind every Subcontractor and Material Supplier (and require every Subcontractor to so bind its subcontractors and material suppliers) to all the provisions of this Agreement and the Contract Documents as they apply to the Subcontractor's or Material Supplier's portions of the Work.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 If this Agreement is terminated, each subcontract and supply agreement shall be assigned by the Constructor to the Owner, subject to the prior rights of any surety, provided that:

5.4.1.1 this Agreement is terminated by the Owner pursuant to sections 11.3 or 11.4; and

5.4.1.2 the Owner accepts such assignment after termination by notifying the Subcontractor and Constructor in writing, and assumes all rights and obligations of the Constructor pursuant to each subcontract agreement.

5.4.2 If the Owner accepts such an assignment, and the Work has been suspended for more than thirty (30) consecutive Days, following termination, if appropriate, the Subcontractor's compensation shall be equitably adjusted as a result of the suspension.

ARTICLE 6 TIME

6.1 DATE OF COMMENCEMENT The Date of Commencement is the Agreement date in ARTICLE 1 unless otherwise set forth below: [_____]

6.1.1 SUBSTANTIAL/FINAL COMPLETION The dates of Substantial and Final Completion shall be as defined in the Front End Documents for this project.

6.1.2 Time is of the essence for this Agreement and the Contract Documents.

6.1.3 Unless instructed by the Owner in writing, the Constructor shall not knowingly commence the Work before the effective date of insurance and Bonds to be provided by the Constructor as required by the Contract Documents.

6.2 SCHEDULE OF THE WORK

6.2.1 Before submitting the first application for payment, the Constructor shall submit to the Owner, and if directed, to the Design Professional, a Schedule of the Work showing the dates on which the Constructor plans to commence and complete various parts of the Work, including dates on which information and approvals are required from the Owner. The Constructor shall comply with the approved Schedule of the Work, unless directed by the Owner to do otherwise or the Constructor is otherwise entitled to an adjustment in the Contract Time. The Constructor shall update the Schedule of the Work on a monthly basis or at appropriate intervals as required by the conditions of the Work and the Project.

6.2.2 The Owner may determine the sequence in which the Work shall be performed, provided it does not unreasonably interfere with the Schedule of the Work. The Owner may require the Constructor to make reasonable changes in the sequence at any time during the performance of the Work in order to facilitate the performance of work by the Owner or Others. To the extent such changes increase the Constructor's costs or time, the Contract Price and Contract Time shall be equitably adjusted.

6.3 DELAYS AND EXTENSIONS OF TIME

6.3.1 If the Constructor is delayed at any time in the commencement or progress of the Work by any cause beyond the control of the Constructor, the Constructor shall be entitled to an equitable extension of the Contract Time. Examples of causes beyond the control of the Constructor include, but are not limited to, the following: (a) acts or omissions of the Owner, the Design Professional, or Others; (b) changes in the Work or the sequencing of the Work ordered by the Owner, or arising from decisions of the Owner that impact the time of performance of the Work; (c) encountering Hazardous Materials, or concealed or unknown conditions; (d) delay authorized by the Owner pending dispute resolution or suspension by the Owner under section 11.1; (e) transportation delays not reasonably foreseeable; (f) labor disputes not involving the Constructor; (g) general labor disputes impacting the Project but not specifically related to the Worksite; (h) fire; (i) Terrorism; (j) epidemics; (k) adverse governmental actions; (l) unavoidable accidents or circumstances; (m) adverse weather conditions not reasonably anticipated. The Constructor shall submit any requests for equitable extensions of Contract Time in accordance with ARTICLE 8.

6.3.2 In addition, if the Constructor incurs additional costs as a result of a delay that is caused by items (a) through (d) immediately above, the Constructor shall be entitled to an equitable adjustment in the Contract Price subject to section 6.6.

6.3.3 NOTICE OF DELAYS If delays to the Work are encountered for any reason, the Constructor shall provide prompt written notice to the Owner of the cause of such delays after the Constructor

first recognizes the delay. The Owner and the Constructor agree to take reasonable steps to mitigate the effect of such delays.

6.4 NOTICE OF DELAY CLAIMS If the Constructor requests an equitable extension of the Contract Time or an equitable adjustment in the Contract Price as a result of a delay described in the section above, the Constructor shall give the Owner written notice of the claim in accordance with section 8.4. If the Constructor causes delay in the completion of the Work, the Owner shall be entitled to recover its additional costs subject to section 6.6. The Owner shall process any such claim against the Constructor in accordance with ARTICLE 8.

6.5 LIQUIDATED DAMAGES

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6.5.1 SUBSTANTIAL COMPLETION Application of liquidated damages shall be as identified the Advertisement for Bids.

6.5.1.1 The Constructor understands that if the Date of Substantial Completion established by this Agreement, as may be amended by subsequent Change Order, is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The Constructor agrees that if the Date of Substantial Completion is not attained, the Constructor shall pay the Owner the amount specified in the Advertisement for Bids as liquidated damages and not as a penalty for each Day that Substantial Completion extends beyond the Date of Substantial Completion. The liquidated damages provided herein shall be in lieu of all liability for any and all extra costs, losses, expenses, claims, penalties, and any other damages of whatsoever nature incurred by the Owner which are occasioned by any delay in achieving the Date of Substantial Completion.

6.5.2 FINAL COMPLETION Application of liquidated damages shall be as identified the Advertisement for Bids.

6.5.2.1 The Constructor understands that if the Date of Final Completion established by this Agreement, as may be amended by subsequent Change Order, is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The Constructor agrees that if the Date of Final Completion is not attained, the Constructor shall pay the Owner the amount specified in the Advertisement for Bids as liquidated damages and not as a penalty for each Day that Final Completion extends beyond the Date of Final Completion. The liquidated damages provided herein shall be in lieu of all liability for any and all extra costs, losses, expenses, claims, penalties, and any other damages of whatsoever nature incurred by the Owner which are occasioned by any delay in achieving the Date of Final Completion.

6.5.3 OTHER LIQUIDATED DAMAGES The Owner and the Constructor may agree upon the imposition of liquidated damages based on other project milestones or performance requirements. Such agreement shall be included as an exhibit to this Agreement.

6.6 LIMITED MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES Except for damages mutually agreed upon by the Parties as liquidated damages in section 6.5 and excluding losses covered by insurance required by the Contract Documents, the Owner and the Constructor agree to waive all claims against each other for any consequential damages that may arise out of or relate to this Agreement, except for those specific items of damages excluded from this waiver as mutually agreed upon by the Parties and identified below. The Owner agrees to waive damages, including but not limited to the Owner's loss of use of the Project, any rental expenses incurred, loss of income, profit, or financing related to the Project, as well as the loss of business, loss of financing, loss of profits not related to this Project, loss of reputation, or insolvency. The Constructor agrees to waive damages, including but not limited to loss of

business, loss of financing, loss of profits not related to this Project, loss of bonding capacity, loss of reputation, or insolvency. The provisions of this section shall also apply to the termination of this Agreement and shall survive such termination. The following are excluded from this mutual waiver: None; unless identified elsewhere in the Contract Documents.

6.6.1 The Owner and the Constructor shall require similar waivers in contracts with Subcontractors and Others retained for the Project.

ARTICLE 7 PRICE

7.1 LUMP SUM As full compensation for performance by the Constructor of the Work in conformance with the Contract Documents, the Owner shall pay the Constructor the lump sum price of [_____] dollars ($[_____]). The lump sum price is hereinafter referred to as the Contract Price, which shall be subject to increase or decrease as provided in ARTICLE 8.

7.2 ALLOWANCES

7.2.1 All allowances stated in the Contract Documents shall be included in the Contract Price. While the Owner may direct the amounts of, and particular material suppliers or subcontractors for specific allowance items, if the Constructor reasonably objects to a material supplier or subcontractor, it shall not be required to contract with them. The Owner shall select allowance items in a timely manner so as not to delay the Work.

7.2.2 Allowances shall include the costs of materials, supplies and equipment delivered to the Worksite, less applicable trade discounts and including requisite taxes, unloading and handling at the Worksite, and labor and installation, unless specifically stated otherwise. The Constructor's Overhead and profit for the allowances shall be included in the Contract Price, but not in the allowances. The Contract Price shall be adjusted by Change Order to reflect the actual costs when they are greater than or less than the allowances.

ARTICLE 8 CHANGES

Changes in the Work that are within the general scope of this Agreement shall be accomplished, without invalidating this Agreement, by Change Order, and Interim Directed Change.

8.1 CHANGE ORDER

8.1.1 The Constructor may request or the Owner may order changes in the Work or the timing or sequencing of the Work that impacts the Contract Price or the Contract Time. All such changes in the Work that affect Contract Time or Contract Price shall be formalized in a Change Order and processed in accordance with this article.

8.1.2 For changes in the Work, the Owner and the Constructor shall negotiate an appropriate adjustment to the Contract Price or the Contract Time in good faith and conclude negotiations as expeditiously as possible. Acceptance of the Change Order and any adjustment in the Contract Price or Contract Time shall not be unreasonably withheld.

8.1.3 NO OBLIGATION TO PERFORM The Constructor shall not be obligated to perform changes in the Work that impact Contract Price or Contract Time until a Change Order has been executed or a written Construction Change Directive (CCD) has been issued.

8.2 CONSTRUCTION CHANGE DIRECTIVE

8.2.1 The Owner may issue a written CCD directing a change in the Work prior to reaching agreement with the Constructor on the adjustment, if any, in the Contract Price or the Contract Time.

8.2.2 The Owner and the Constructor shall negotiate expeditiously and in good faith for appropriate adjustments, as applicable, to the Contract Price or the Contract Time arising out of a CCD. If there is a dispute as to the cost to the Owner, the Parties reserve their rights as to the disputed amount, subject to the requirements of ARTICLE 12.

8.2.3 When the Owner and the Constructor agree upon the adjustment in the Contract Price or the Contract Time, for a change in the Work directed by a CCD, such agreement shall be the subject of a Change Order. The Change Order shall include all outstanding Interim Directed Changes on which the Owner and Constructor have reached agreement on Contract Price or Contract Time issued since the last Change Order.

8.3 DETERMINATION OF COST

8.3.1 An increase or decrease in the Contract Price or the Contract Time resulting from a change in the Work shall be determined by one or more of the following methods:

8.3.1.1 unit prices set forth in this Agreement or as subsequently agreed;

8.3.1.2 a mutually accepted, itemized lump sum;

8.3.1.3 COST OF THE WORK Cost of the Work as defined by this subsection plus 15% for Overhead and profit on direct costs of the Constructor and its Subcontractors. A markup of five percent (5%) is allowed on the cost of the Work of Subcontractors. “Cost of the Work” shall include the following costs reasonably incurred to perform a change in the Work:

8.3.1.3.1 wages paid for labor in the direct employ of the Constructor in the performance of the Work;

8.3.1.3.2 salaries of the Constructor's employees when stationed at the field office to the extent necessary to complete the applicable Work:

8.3.1.3.3 cost of applicable employee benefits and taxes, including but not limited to, workers' compensation, unemployment compensation, social security, health, welfare, retirement and other fringe benefits as required by law, labor agreements, or paid under the Constructor's standard personnel policy, insofar as such costs are paid to employees of the Constructor who are included in the Cost of the Work in subsections 8.3.1.3.1 and 8.3.1.3.2 immediately above;

8.3.1.3.4 cost of all materials, supplies, and equipment incorporated in the Work, including costs of inspection and testing if not provided by the Owner, transportation, storage, and handling;

8.3.1.3.5 payments made by the Constructor to Subcontractors for Work performed under this Agreement;

8.3.1.3.6 rental charges of all necessary machinery and equipment, exclusive of hand tools owned by workers, used at the Worksite, including installation, repair and replacement, dismantling, removal, maintenance, transportation, and delivery costs. Rental from unrelated third parties shall be reimbursed at actual cost;

8.3.1.3.7 cost of the premiums for all insurance and surety bonds which the Constructor is required to procure or deems necessary, and approved by the Owner including any additional premium incurred as a result of any increase in the cost of the Work;

8.3.1.3.8 sales, use, gross receipts or other taxes, tariffs, or duties related to the Work for which the Constructor is liable;

8.3.1.3.9 permits, fees, licenses, tests, and royalties;

8.3.1.3.10 reproduction costs, photographs, facsimile transmissions, long-distance telephone calls, data processing costs and services, postage, express delivery charges, data transmission, telephone service, and computer-related costs at the Worksite to the extent such items are used and consumed in the performance of the Work or are not capable of use after completion of the Work;

8.3.1.3.11 all water, power, and fuel costs necessary for the Work;

8.3.1.3.12 cost of removal of all nonhazardous substances, debris, and waste materials;

8.3.1.3.13 all costs directly incurred to perform a change in the Work which are reasonably inferable from the Contract Documents for the Changed Work;

8.3.1.3.14 DISCOUNTS All discounts for prompt payment shall accrue to the Owner to the extent such payments are made directly by the Owner. To the extent payments are made with funds of the Constructor, all cash discounts shall accrue to the Constructor. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment, shall be credited to the Cost of the Work;

8.3.1.3.15 COST REPORTING The Constructor shall maintain in conformance with generally accepted accounting principles a complete and current set of records that are prepared or used by the Constructor to calculate the Cost of Work. The Owner shall, upon request and during normal business hours, be afforded access to and the right to examine the Constructor's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda and similar data relating to requested payment for Cost of the Work. The Constructor shall preserve and afford the Owner the right to examine all such records for a period of three (3) years after the final payment or longer where required by law. The Constructor shall preserve all records relating to a claim arising out of the performance of this Agreement until the claim has been resolved. In the event that an examination of the Constructor's records discloses any payment error, the Constructor shall promptly refund any overpayment it has received. Further, if any governmental agency provides any funds for the Project, then the Constructor shall maintain such records and permit such audits of its records as are required by such governmental agency. This provision shall also apply to Subcontractors and Suppliers;

8.3.1.3.16 COST AND SCHEDULE ESTIMATES The Constructor shall use reasonable skill and judgment in the preparation of a cost estimate or schedule for a change to the Work, but does not warrant or guarantee their accuracy.

8.3.1.4 If an increase or decrease in the Contract Price or Contract Time cannot be agreed to as set forth in subsection 8.3.1, and the Owner issues a CCD, the cost of the change in the Work shall be determined by the reasonable actual expense incurred and savings realized in the performance of the Work resulting from the change. If there is a net increase in the Contract Price, the Constructor's Overhead and profit shall be adjusted accordingly. In case of a net decrease in the Contract Price, the Constructor's Overhead and profit shall not be adjusted unless ten percent (10%) or more of the Project is deleted. The Constructor shall maintain a documented, itemized accounting evidencing the expenses and savings.

8.3.2 If unit prices are set forth in the Contract Documents or are subsequently agreed to by the Parties, but the character or quantity of such unit items as originally contemplated is so different in a proposed Change Order that the original unit prices will cause substantial inequity to the Owner or the Constructor, such unit prices shall be equitably adjusted.

8.3.3 If the Owner and the Constructor disagree as to whether work required by the Owner is within the scope of the Work, the Constructor shall furnish the Owner with an estimate of the costs to perform the disputed work in accordance with the Owner's interpretations. If the Owner issues a written order for the Constructor to proceed, the Constructor shall perform the disputed work and the Owner shall pay the Constructor fifty percent (50%) of its estimated cost to perform the work. In such event, both Parties reserve their rights as to whether the work was within the scope of the Work, subject to the requirements of ARTICLE 12. The Owner's payment does not prejudice its right to be reimbursed should it be determined that the disputed work was within the scope of the Work. The Constructor's receipt of payment for the disputed work does not prejudice its right to receive full payment for the disputed work should it be determined that the disputed work is not within the scope of the Work.

8.4 CLAIMS FOR ADDITIONAL COST OR TIME Except as provided in subsection 6.3.2 and section 6.4 for any claim for an increase in the Contract Price or the Contract Time, the Constructor shall give the Owner written notice of the claim within fourteen (14) Days after the occurrence giving rise to the claim or within fourteen (14) Days after the Constructor first recognizes the condition giving rise to the claim, whichever is later. Except in an emergency, notice shall be given before proceeding with the Work. Thereafter, the Constructor shall submit written documentation of its claim, including appropriate supporting documentation, within twenty-one (21) Days after giving notice, unless the Parties mutually agree upon a longer period of time. The Owner shall respond in writing denying or approving the Constructor's claim no later than fourteen (14) Days after receipt of the Constructor's claim. Owner's failure to so respond shall be deemed a denial of the claim. Any change in the Contract Price or the Contract Time resulting from such claim shall be authorized by Change Order.

8.5 INCIDENTAL CHANGES The Owner may direct the Constructor to perform incidental changes in the Work, upon concurrence with the Constructor that such changes do not involve adjustments in the Contract Price or Contract Time. Incidental changes shall be consistent with the scope and intent of the Contract Documents. The Owner shall initiate an incidental change in the Work by issuing a written order to the Constructor. Such written notice shall be carried out promptly and is binding on the Parties.

ARTICLE 9 PAYMENT

9.1 SCHEDULE OF VALUES Within twenty-four (24) hours after submission of it bid(s), the Constructor shall prepare and submit to the Owner and, if directed, the Design Professional, a schedule of values apportioned to the various divisions or phases of the Work. Each line item contained in the schedule of values shall be assigned a value such that the total of all items shall equal the Contract Price.

9.2 PROGRESS PAYMENTS

9.2.1 APPLICATIONS The Constructor shall submit to the Owner and the Design Professional a monthly application for payment no later than the first Day of the calendar month for the preceding thirty (30) Days. Constructor's applications for payment shall be itemized and supported by the Constructor's schedule of values and any other substantiating data as required by this Agreement. Applications for payment shall include payment requests on account of properly authorized Change Orders or Interim Directed Changes. The Owner shall pay the amount otherwise due on any payment application, as certified by the Design Professional, no later than twenty (30) Days after the Constructor has submitted a complete and accurate payment application, or such shorter time period as required by applicable state statute. The Owner may deduct from any progress payment amounts that may be retained pursuant to subsection 9.2.4.

9.2.2 STORED MATERIALS AND EQUIPMENT Unless otherwise provided in the Contract Documents, applications for payment may include materials and equipment not yet incorporated into the Work but delivered to and suitably stored onsite or offsite including applicable insurance, storage, and costs incurred transporting the materials to an offsite storage facility. Approval of payment applications for stored materials and equipment stored offsite shall be conditioned on a submission by the Constructor of bills of sale and proof of required insurance, or such other documentation satisfactory to the Owner to establish the proper valuation of the stored materials and equipment, the Owner's title to such materials and equipment, and to otherwise protect the Owner's interests therein, including transportation to the Worksite.

9.2.3 LIEN WAIVERS AND LIENS

9.2.3.1 PARTIAL LIEN WAIVERS AND AFFIDAVITS If required by the Owner, as a prerequisite for payment, the Constructor shall provide partial lien and claim waivers in the amount of the application for payment and affidavits from its Subcontractors and Material Suppliers for the completed Work. Such waivers shall be conditional upon payment. In no event shall the Constructor be required to sign an unconditional waiver of lien or claim, either partial or final, prior to receiving payment or in an amount in excess of what it has been paid. Each Application for Payment shall be accompanied by 2 copies of the "Contractor's Affidavit, Waiver of Lien, and Wage Statement." A copy is included in this set of specifications.

9.2.3.2 RESPONSIBILITY FOR LIENS If the Owner has made payments in the time required by this article, the Constructor shall, within thirty (30) Days after filing, cause the removal of any liens filed against the premises or public improvement fund by any party or parties performing labor or services or supplying materials in connection with the Work. If the Constructor fails to take such action on a lien, the Owner may cause the lien to be removed at the Constructor's expense, including bond costs and reasonable attorneys' fees. This subsection shall not apply if there is a dispute pursuant to ARTICLE 12 relating to the subject matter of the lien.

9.2.4 RETAINAGE From each progress payment made prior to Substantial Completion, the Owner may retain Ten percent (10%) of the amount otherwise due after deduction of any amounts as provided in section 9.3, and in no event shall such percentage exceed any applicable statutory requirements. If the Owner chooses to use this retainage provision:

9.2.4.1 after the Work is fifty percent (50%) complete, the Owner may elect not to withhold additional retainage and may pay the Constructor the full amount due on account of subsequent progress payments;

9.2.4.2 the Owner may, in its sole discretion, reduce the amount to be retained at any time;

9.2.4.3 the Owner may release retainage on that portion of the Work a Subcontractor has completed in whole or in part, and which the Owner has accepted. In lieu of retainage, the Constructor may furnish a retention bond or other security interest acceptable to the Owner, to be held by the Owner.

9.2.4.4 Any request for payment, which includes a reduction in the contract retainage, or any request for final payment shall be accompanied by a Consent of Surety.

9.3 ADJUSTMENT OF CONSTRUCTOR'S PAYMENT APPLICATION The Owner may adjust or reject a payment application or nullify a previously approved payment application, in whole or in part, as may reasonably be necessary to protect the Owner from loss or damage based upon the following, to the extent that the Constructor is responsible under this Agreement:

9.3.1 the Constructor's repeated failure to perform the Work as required by the Contract Documents;

9.3.2 Except as accepted by the insurer providing builders risk or other property insurance covering the project, loss or damage arising out of or relating to this Agreement and caused by the Constructor to the Owner or to Others to whom the Owner may be liable;

9.3.3 the Constructor's failure to properly pay Subcontractors and Material Suppliers following receipt of such payment from the Owner;

9.3.4 rejected, nonconforming or Defective Work not corrected in a timely fashion;

9.3.5 reasonable evidence of delay in performance of the Work such that the Work will not be completed within the Contract Time;

9.3.6 reasonable evidence demonstrating that the unpaid balance of the Contract Price is insufficient to fund the cost to complete the Work; and

9.3.7 uninsured third-party claims involving the Constructor, or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until the Constructor furnishes the Owner with adequate security in the form of a surety bond, letter of credit, or other collateral or commitment sufficient to discharge such claims if established.

No later than seven (7) Days after receipt of an application for payment, the Owner shall give written notice to the Constructor, at the time of disapproving or nullifying all or part of an application for payment, stating its specific reasons for such disapproval or nullification, and the remedial actions to be taken by the Constructor in order to receive payment. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be promptly made for the amount previously withheld.

9.4 ACCEPTANCE OF WORK Neither the Owner's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of Work not complying with the Contract Documents.

9.5 PAYMENT DELAY If for any reason not the fault of the Constructor, the Constructor does not receive a progress payment from the Owner within seven (7) Days after the time such payment is due, then the Constructor, upon giving seven (7) Days' written notice to the Owner, and without prejudice to and in addition to any other legal remedies, may stop Work until payment of the full amount owing to the Constructor has been received.

9.6 SUBSTANTIAL COMPLETION

9.6.1 The Constructor shall notify the Owner and, if directed, the Design Professional, when it considers Substantial Completion of the Work or a designated portion to have been achieved. The Owner, with the assistance of its Design Professional, shall promptly conduct an inspection to determine whether the Work or designated portion can be occupied or used for its intended use by the Owner without excessive interference in completing any remaining unfinished Work. If the Owner determines that the Work or designated portion has not reached Substantial Completion, the Owner shall promptly compile a list of items to be completed or corrected so the Owner may occupy or use the Work or designated portion for its intended use. The Constructor shall promptly complete all items on the list.

9.6.2 When Substantial Completion of the Work or a designated portion is achieved, the Constructor shall prepare a Certificate of Substantial Completion establishing the date of Substantial Completion and the respective responsibilities of the Owner and Constructor for interim items such as security, maintenance, utilities, insurance, and damage to the Work. In the absence of a clear delineation of responsibilities, the Owner shall assume all responsibilities for items such as security, maintenance, utilities, insurance, and damage to the Work. The Certificate of Substantial Completion shall also list any items to be completed or corrected, and establish the time for their completion or correction. The Certificate of Substantial Completion shall be submitted by the Constructor to the Owner and, if directed, to the Design Professional for written acceptance of responsibilities assigned in the Certificate of Substantial Completion.

9.6.3 Unless otherwise provided in the Certificate of Substantial Completion, warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or a designated portion.

9.6.4 Upon the Owner’s written acceptance of the Certificate of Substantial Completion, the Owner shall pay to the Constructor the remaining retainage held by the Owner for the Work described in the Certificate of Substantial Completion, less a sum equal to two hundred percent (200%) of the estimated cost of completing or correcting remaining items on that part of the Work, as agreed to by the Owner and Constructor as necessary to achieve Final Completion. Uncompleted items shall be completed by the Constructor in a mutually agreed upon timeframe. The Owner shall pay the Constructor monthly the amount retained for unfinished items as each item is completed.

9.7 PARTIAL OCCUPANCY OR USE

9.7.1 The Owner may occupy or use completed or partially completed portions of the Work when (a) the portion of the Work is designated in a Certificate of Substantial Completion, (b) appropriate insurer(s) consent to the occupancy or use, and (c) appropriate public authorities authorize the occupancy or use. Such partial occupancy or use shall constitute Substantial Completion of that portion of the Work.

9.8 FINAL COMPLETION AND FINAL PAYMENT

9.8.1 Upon notification from the Constructor that the Work is complete and ready for final inspection and acceptance, the Owner with the assistance of its Design Professional shall promptly conduct an inspection to determine if the Work has been completed and is acceptable under the Contract Documents.

9.8.2 When Final Completion has been achieved, the Constructor shall prepare for the Owner's written acceptance a final application for payment stating that to the best of the Constructor's knowledge, and based on the Owner's inspections, the Work has reached Final Completion in accordance with the Contract Documents.

9.8.3 Final payment of the balance of the Contract Price shall be made to the Constructor within twenty (20) Days after the Constructor has submitted a complete and accurate application for final payment, including submissions required under the subsection below.

9.8.4 Final payment shall be due on the Constructor's submission of the following to the Owner:

(a) an affidavit declaring any indebtedness connected with the Work, *e.g.* payrolls or invoices for materials or equipment, to have been paid, satisfied, or to be paid with the proceeds of final payment, so as not to encumber the Owner's property;
(b) as-built drawings, manuals, copies of warranties, and all other close-out documents required by the Contract Documents;
(c) release of any liens, conditioned on final payment being received;
(d) consent of any surety; and
(e) any outstanding known and unreported accidents or injuries experienced by the Constructor or its Subcontractors at the Worksite.
(f) The Constructor shall complete and submit a "Verification of Minority Business Enterprises (MBE) and/or Women Business Enterprises (WBE) Participation" form with the Final Application for Payment only. A copy is included in this set of specifications.

9.8.5 If, after Substantial Completion of the Work, the Final Completion of a portion of the Work is materially delayed through no fault of the Constructor, the Owner shall pay the balance due for portion(s) of the Work fully completed and accepted. If the remaining contract balance for Work not fully completed and accepted is less than the retained amount prior to payment, the Constructor shall submit to the Owner, and if directed, the Design Professional, the written consent of any surety to payment of the balance due for portions of the Work that are fully completed and accepted. Such payment shall not constitute a waiver of claims, but otherwise shall be governed by these final payment provisions.

9.8.6 OWNER RESERVATION OF CLAIMS Claims not reserved in writing by the Owner with the making of final payment shall be waived except for claims relating to liens or similar encumbrances, warranties, Defective Work, and latent defects.

9.8.7 CONSTRUCTOR ACCEPTANCE OF FINAL PAYMENT Unless the Constructor provides written identification of unsettled claims with an application for final payment, its acceptance of final payment constitutes a waiver of such claims.

9.9 LATE PAYMENT Payments due but unpaid shall bear interest from the date payment is due at the statutory rate at the place of the Project.

ARTICLE 10 INDEMNITY, INSURANCE, AND BONDS

10.1 INDEMNITY

10.1.1 To the fullest extent permitted by law, the Constructor shall indemnify and hold harmless the Owner, the Owner's officers, directors, members, consultants, agents, and employees, the Design Professional, and Others (the Indemnitees) from all claims for bodily injury and property damage, other than to the Work itself and other property insured, including reasonable attorneys' fees, costs and expenses, that may arise from the performance of the Work, but only to the extent caused by the negligent acts or omissions of the Constructor, Subcontractors, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable. The Constructor shall be entitled to reimbursement of any defense costs paid above the Constructor's percentage of liability for the underlying claim to the extent provided for by the subsection below.

10.1.2 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Constructor, its officers, directors, members, consultants, agents, and employees, Subcontractors, or anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable from all claims for bodily injury and property damage, other than property insured, including reasonable attorneys' fees, costs and expenses, that may arise from the performance of work by the Owner, the Design Professional, or Others, but only to the extent caused by the negligent acts or omissions of the Owner, the Design Professional, or Others. The Owner shall be entitled to reimbursement of any defense costs paid above the Owner's percentage of liability for the underlying claim to the extent provided for by the subsection above.

10.1.3 NO LIMITATION ON LIABILITY In any and all claims against the Indemnitees by any employee of the Constructor, anyone directly or indirectly employed by the Constructor or anyone for whose acts the Constructor may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Constructor under workers' compensation acts, disability benefit acts, or other employment benefit acts.

10.2 INSURANCE

10.2.1 The Constructor shall not commence the Work before the effective date of insurance that is required to be provided by the Constructor or the Owner.

10.2.2 Before commencing the Work and as a condition precedent to payment, the Constructor shall procure and maintain in force Workers' Compensation Insurance, Employers' Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability Insurance (CGL) with limits of liability described in the “Required Insurance Coverage” table found in subsection 10.2.8. The CGL policy shall include coverage for liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, contractual liability, and broad form property damage. The Constructor shall maintain completed operations liability insurance for one year after Substantial Completion, or as required by the Contract Documents, whichever is longer. The Constructor's Employers' Liability, Business Automobile Liability, and CGL policies, shall be written with at least the following limits of liability:

(1) Comprehensive or Commercial Form General Liability Insurance covering all Work done by or on behalf of the Constructor and providing insurance for bodily injury, personal injury, property damage, and Contractual liability. Except with respect to bodily injury and property damage included within the products and completed operations hazards, the aggregate limit shall apply separately to work required of the Constructor by these Contract Documents. This insurance shall include the contractual obligations assumed under the Contract Documents. Limits of liability shall not be less than those identified in subsection 10.2.8 “Required Insurance Coverage” table, per

occurrence and general aggregate, which limits may be achieved under a single policy or by a combination of underlying and excess or umbrella policies.

(2) Business Automobile Liability Insurance on an "Occurrence" form covering owned, hired, leased, and non-owned automobiles used by or on behalf of the Constructor and providing insurance for bodily injury, property damage, and Contractual liability. Limits of liability shall not be less than those identified in subsection 10.2.8 "Required Insurance Coverage" table, per occurrence, which limits may be achieved under a single policy or by a combination of underlying and excess or umbrella policies.

(3) Worker's Compensation and Employer's Liability Insurance as required by Federal and Michigan law. The Constructor shall also require all of its Subcontractors to maintain this insurance coverage. Limits of liability shall not be less than statutory for worker's compensation insurance, and $1,000,000 each accident for employer's liability insurance.

(4) The Umbrella Excess Liability insurance must be consistent with and follow the form of the primary policies, except that Umbrella Excess Liability insurance shall not be required for the Medical Expense Limit.

(5) Pollution Legal Liability Insurance. Coverage shall apply to sudden and gradual pollution legal liability including defense costs and completed operations. If the coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of three years beginning from the time that work under this Contract is completed. Contractors or subcontractors responsible for remediation, including containerization, transportation, or disposal of any hazardous or toxic wastes, materials, or substances requiring permits or licenses by state or Federal Law or regulation shall maintain Pollution Liability Insurance with limit no less than Note 2 in the 10.2.8 "Required Insurance Coverage Table". Coverage shall extend for 3 years after completion of the Work and be evidenced by annual certificates of insurance.

(6) Builder's Risk/Property Insurance. As identified in subsection 10.2.8 "Required Insurance Coverage" table, the Constructor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus the value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Owner has an insurable interest, whichever is later. This insurance shall include interests of the Owner, the Constructor, Subcontractors, and Sub-Subcontractors in the Project.

10.2.3 Proof of Coverage: Certificates of Insurance, as evidence of the insurance required by these Contract Documents, shall be submitted by the Constructor to the Owner no later than the date of execution of this agreement and in all cases prior to the commencement of the Work. The Certificates of Insurance shall state the scope of coverage and deductible, identify any endorsements to the policies and, except for the worker's compensation and employer's liability

insurance, list the Owner as an additional insured. Any deductible shall be the Constructor's liability. The Certificates of Insurance shall provide for no cancellation or modification of coverage without thirty (30) days prior written notice to the Owner in paper or electronic format. Acceptance of Certificates of Insurance by the Owner shall not in any way limit the Constructor's liabilities under the Contract Documents. In the event the Constructor does not comply with these insurance requirements, the Owner may, at its option, provide insurance coverage to protect the Owner; the cost of such insurance shall be deducted from the Contract Sum or otherwise paid by the Constructor. Renewal certifications shall be filed in a timely manner for all coverage until the Project is accepted as complete. Upon the Owner's request, the Constructor shall provide copies of the Builder's Risk insurance policy obtained from the insurers.

10.2.4 Subcontractors' Insurance: The Constructor shall either require subcontractors to carry the insurance or the Constructor shall insure the activities of the subcontractors in the types and form of insurance required under the Contract Documents, and in such amounts as the Constructor shall deem appropriate.

10.2.5 Scope of Insurance Coverage: The Constructor's insurance as required by the Contract Documents (including subcontractors' insurance), by endorsement to the policies and the Certificates of Insurance, shall include the following and may be presented in the form of a rider attached to the Certificates of Insurance:

(a) The Owner, its trustees, their officers, employees, representatives and agents including the Design Professional, shall be included as additional insureds (except under worker's compensation and employer's liability insurance) for and relating to the Work to be performed by the Constructor and subcontractors.
(b) A Severability of Interest Clause stating that, "The term 'insured' is hereby used severally and not collectively, but the inclusion herein of more than one insured shall not operate to increase the limits of the insurer's or insurers' liability."
(c) A Cross Liability Clause stating that, "In the event of claims being made under any of the coverages of the policy or policies referred to herein by one or more insured hereunder for which another or other insured hereunder may be liable, then the policy or policies shall cover such insured or insured against whom a claim is made or may be made in the same manner as if separate policies had been issued to each insured hereunder. Nothing contained herein, however, shall operate to increase the insurer's limits of liability as set forth in the insuring agreements."
(d) Coverage provided is primary and is not in excess of or contributing with any insurance or self-insurance maintained by the Board of Trustees of Michigan State University, the Owner, their officers, employees, representatives and agents.

10.2.6 Employers' Liability, Business Automobile Liability, and CGL coverage required under subsection 10.2.2 may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by Excess or Umbrella Liability policies.

10.2.7 The Constructor shall maintain in effect all insurance coverage required under subsection 10.2.2 with insurance companies lawfully authorized to do business in the jurisdiction in which the Project is located. If the Constructor fails to obtain or maintain any insurance coverage required under this Agreement, the Owner may purchase such coverage and charge the expense to the Constructor, or terminate this Agreement. All insurance carriers shall possess a minimum A.M. Best rating of A VII.

10.2.8 To the extent commercially available to the Constructor from its current insurance company, insurance policies required under subsection 10.2.2 shall contain a provision that the insurance

company or its designee must give the Owner written notice transmitted in paper or electronic format: (a) 30 days before coverage is non-renewed by the insurance company and (b) within 10 business days after cancelation of coverage by the insurance company. Prior to commencing the Work and upon renewal or replacement of the insurance policies, the Constructor shall furnish the Owner with certificates of insurance until one year after Substantial Completion or longer if required by the Contract Documents. In addition, if any insurance policy required under subsection 10.2.2 is not to be immediately replaced without lapse in coverage when it expires, exhausts its limits, or is to be cancelled, the Constructor shall give Owner prompt written notice upon actual or constructive knowledge of such condition.

The insurance requirements for this contract are governed by the project size, and coverage shall be provided in accordance to the following table of "Required Insurance Coverage":

Contract Amount:	General Liability	Auto	Worker's Comp	Builder's Risk	Performance and Payment Bond	Pollution Liability
<$50,000	$1,000,000	$1,000,000	$1,000,000	not required	not required	Note 1
Between $50,000 and $250,000	$1,000,000	$1,000,000	$1,000,000	not required	100% of contract	Note 1
Between $250,000 and $10,000,000	$1,000,000	$1,000,000	$1,000,000	Note 2	100% of contract	Note 1
>$10,000,000	$5,000,000	$1,000,000	$1,000,000	Note 2	100% of contract	Note 1

Required Insurance Coverage Table Notes:

1. $1,000,000 unless work involves licensed abatement, remediation, or hauling, then $5,000,000.
2. 100% of contract (equivalent installation floater accepted for roads, roofs, and other suitable project types).

10.3 PROPERTY INSURANCE [DELETED]

10.3.1 The Owner and the Constructor waive all rights against each other and their respective employees, agents, contractors, subcontractors and sub-subcontractors, and design professionals

for damages caused by risks covered by the property insurance except such rights as they may have to the proceeds of the insurance and such rights as the Constructor may have for the failure of the Owner to obtain and maintain property insurance in compliance with subsection 10.3.1.

10.3.2 The Constructor shall indemnify and hold harmless the Owner against any and all liability, claims, demands, damages, losses, and expenses, including attorneys' fees, in connection with or arising out of any damage or alleged damage to any of the Owner's existing adjacent property that may arise from the performance of the Work, to the extent caused by the negligent acts or omissions of the Constructor, Subcontractor, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable.

10.3.3 RISK OF LOSS Except to the extent a loss is covered by applicable insurance, risk of loss or damage to the Work shall be upon the Constructor until the Date of Substantial Completion, unless otherwise agreed to by the Parties.

☐☐OWNER'S INSURANCE

10.4.1 BUSINESS INCOME INSURANCE The Owner may procure and maintain insurance against loss of use of the Owner's property caused by fire or other casualty loss.

10.4.2 OWNER'S LIABILITY INSURANCE The Owner shall either self-insure or obtain and maintain its own liability insurance for protection against claims arising out of the performance of this Agreement, including, without limitation, loss of use and claims, losses, and expenses arising out of the Owner's acts or omissions.

10.5 ADDITIONAL GENERAL LIABILITY COVERAGE

10.5.1 The Owner [_____] shall/ **X** shall not require the Constructor to purchase and maintain additional liability coverage, primary to the Owner's coverage under subsection 10.4.2.

10.5.2 If required by the above subsection, the additional liability coverage required of the Constructor shall be:

1. [_____] Additional Insured. The Owner shall be named as an additional insured on the Constructor's CGL specified for operations and completed operations, but only with respect to liability for bodily injury, property damage, or personal and advertising injury to the extent caused by the negligent acts or omissions of the Constructor, or those acting on the Constructor's behalf, in the performance of the Constructor's Work for the Owner at the Worksite.

2. [_____] OCP. The Constructor shall provide an Owners' and Contractors' Protective Liability Insurance ("OCP") policy with limits equal to the limits on CGL specified, or limits as otherwise required by the Owner.

Any documented additional cost in the form of a surcharge associated with procuring the additional general liability coverage in accordance with this subsection shall be paid by the Owner directly or the costs may be reimbursed by the Owner to the Constructor by increasing the Contract Price to correspond to the actual cost required to purchase and maintain the coverage. Before commencing the Work, the Constructor shall provide either a copy of the OCP policy, or a certificate and endorsement evidencing that the Owner has been named as an additional insured, as applicable.

10.6 ROYALTIES, PATENTS, AND COPYRIGHTS The Constructor shall pay all royalties and license fees which may be due on the inclusion of any patented or copyrighted materials, methods, or systems selected by the Constructor and incorporated in the Work. The Constructor shall defend, indemnify, and hold the Owner harmless from all suits or claims for infringement of any patent rights or copyrights arising out of such selection. The Owner agrees to defend, indemnify, and hold the Constructor harmless from any suits or claims of infringement of any patent rights or copyrights arising out of any patented or copyrighted materials, methods, or systems specified by the Owner or Design Professional.

10.7 BONDS

10.7.1 Performance and Payment Bonds

are **X**/ are not [_____]

required of the Constructor for any contract in excess of $50,000. Such bonds shall be issued by a surety admitted in the state in which the Project is located and must be acceptable to the Owner. Owner's acceptance shall not be withheld without reasonable cause. The penal sum of the bonds shall each be one hundred percent (100%) of the original Contract Price. Any increase in the Contract Price that exceeds ten percent (10%) in the aggregate shall require a rider to the Bonds increasing penal sums accordingly. Up to such ten percent (10%) amount, the penal sum of the bond shall remain equal to one hundred percent (100%) of the Contract Price. The Constructor shall endeavor to keep its surety advised of changes potentially impacting the Contract Time and Contract Price, though the Constructor shall require that its surety waives any requirement to be notified of any alteration or extension of time. A copy of the Constructor's Payment Bond for the Project, if any, shall be furnished by the Owner or the Constructor upon the Subcontractor's written request. The bonding firm must be listed on the current U.S. Department of Treasury Circular 570, rated A- or better by Best and be licensed to do business in the State of Michigan. Bonds are to be made out to the MSU Board of Trustees.

10.7.2 The Constructor shall forward to the Owner fully executed Payment & Performance Bonds in the amount of 100 percent of the Contract value on the AIA Form 312 and in compliance with MCL 129.201 et seq. within five (5) days after execution of the Agreement.

In the same five (5) day period the Constructor shall present to the Owner, in an acceptable form, evidence of the insurance as required by the Contract Documents. Actual Work shall not commence until the bonds and insurance are received by the Owner. Failure to provide the bonds and insurance in the time-frame allowed shall not be cause for an extension of Contract Time.

All alterations, extensions of time, extra and additional work, and other changes authorized by any part of the Contract, including determinations made under ARTICLE 12, shall be made without securing the consent of the surety or sureties on the Contract bonds.

Whenever the Owner has cause to believe that the surety has become insufficient, the Owner may demand in writing that the Constructor provide such further bonds or additional surety, not exceeding that originally required, as in the Owner's opinion is necessary, considering the extent of the work remaining to be done. Thereafter no payment shall be made to the Constructor or any assignee of the Constructor until the further bonds or additional surety has been furnished.

Contract bonds shall remain in full force and effect during the one year guarantee period, unless a longer bond period is stipulated in the Contract Documents.

10.8 PROFESSIONAL LIABILITY INSURANCE To the extent the Constructor is required to procure design services in accordance with section 3.15, the Constructor shall require its design professional to obtain professional liability insurance for claims arising from the negligent performance of design services under this Agreement, with a company reasonably satisfactory to the Owner, including coverage for all professional liability caused by any consultants to the Constructor's design professional, written for not less than the limits required for general liability. The Constructor's design professional shall pay the deductible.

ARTICLE 11 SUSPENSION, NOTICE TO CURE, AND TERMINATION

11.1 SUSPENSION BY OWNER FOR CONVENIENCE

11.1.1 OWNER SUSPENSION Should the Owner order the Constructor in writing to suspend, delay, or interrupt the performance of the Work for the convenience of the Owner and not due to any act or omission of the Constructor or any person or entity for whose acts or omissions the Constructor may be liable, then the Constructor shall immediately suspend, delay or interrupt that portion of the Work for the time period ordered by the Owner. The Contract Price and the Contract Time shall be equitably adjusted by Change Order for the cost and delay resulting from any such suspension.

11.1.2 Any action taken by the Owner that is permitted by any other provision of the Contract Documents and that result in a suspension of part or all of the Work does not constitute a suspension of Work under this section.

11.2 DEFAULT The Owner may terminate this Contract for default if the Constructor materially breaches this Contract by: (i) refusing, failing or being unable to properly manage the Work; (ii) refusing, failing or being unable to supply the Work with sufficient numbers of properly skilled workers, proper materials or construction equipment, or to maintain the Schedule of the Work; (iii) refusing, failing or being unable to make prompt payment to subcontractors or suppliers; (iv) disregarding Laws, ordinances, rules, regulations or orders of any public authority or quasi-public authority having jurisdiction over the Project; or, (v) refusing, failing or being unable to substantially perform in accordance with the terms of the Contract, as determined by the Owner, or as otherwise defined elsewhere herein.

11.2.1 Upon the occurrence of any of the events described in Section 11.2, the Owner shall give written notice to the Constructor setting forth the nature of the default and requesting cure within seven calendar days from the date of notice. Within seven (7) days of receipt of the Owner's notice of default, the Constructor shall furnish the Owner with either (a) written evidence that the default has been cured or (b) a written plan demonstrating steps to be taken by the Construction Manger to cure the default and accomplish completion of the work in accordance with the requirements of the Contract Documents and within established cost and schedule requirements.

11.2.2 In the event of an emergency affecting the safety of persons or property, the Owner may immediately commence and continue satisfactory correction of such default without first giving written notice to the Constructor, but shall give prompt written notice of such action to the Constructor following commencement of the action.

11.3 OWNER'S REMEDIES

11.3.1 If the Constructor fails to cure the default or provide a written plan to cure the default satisfactory to the Owner, or if the Constructor fails to expeditiously continue such cure until complete, the Owner may give written notice to the Constructor of immediate termination, and the

Owner, without prejudice to any other rights or remedies, may take any or all of the following actions: (i) complete all or any part of the Work, including supplying workers, material and equipment which the Owner deems expedient to complete the Work; (ii) contract with Others to complete all or any part of the Work, including supplying workers, material and equipment which the Owner deems expedient to complete the Work; (iii) take such other action as is necessary to correct such failure; (vi) take possession of all materials, tools, construction equipment and machinery on the site owned by the Constructor; (v) directly pay, from Project funds, the Constructor's subcontractors and suppliers compensation due to them from the Constructor; (vi) finish the Work by whatever method the Owner may deem expedient; and, (vii) require the Constructor to assign the Constructor's right, title and interest in any or all of Constructor's subcontracts or orders to the Owner.

11.3.2 USE OF CONSTRUCTOR'S MATERIALS, SUPPLIES, AND EQUIPMENT If the Owner terminates the Contract for cause, and the Owner takes possession of all materials, tools, construction equipment and machinery on the Site owned or leased by the Constructor, the Constructor's compensation shall be increased by fair payment, either by purchase or rental at the election of the Owner, for any materials, tools, construction equipment and machinery items retained, subject to the Owner's right to recover from the Constructor the Owner's damages resulting from the termination.

11.3.3 If the Constructor files a petition under the Bankruptcy Code, this Agreement shall terminate if the Constructor or the Constructor's trustee rejects the Agreement, or if there has been a default and the Constructor is unable to give adequate assurance that the Constructor will perform as required by this Agreement or otherwise is unable to comply with the requirements for assuming this Agreement under the applicable provisions of the Bankruptcy Code.

11.3.4 The Owner shall make reasonable efforts to mitigate damages arising from Constructor default, and shall promptly invoice the Constructor for all amounts due pursuant to sections 11.2 and 11.3.

11.3.5 If the Owner terminates this Agreement for default, and it is later determined that the Constructor was not in default, or that the default was excusable under the terms of the Contract Documents, then, in such event, the termination shall be deemed a termination for convenience, and the rights of the Parties shall be as set forth in section 11.4.

11.4 TERMINATION BY OWNER FOR CONVENIENCE

11.4.1 Upon written notice to the Constructor, the Owner may, without cause, terminate this Agreement. The Constructor shall immediately stop the Work, follow the Owner's instructions regarding shutdown and termination procedures, and strive to minimize any further costs.

11.4.2 If the Owner terminates this Agreement for Convenience, the Constructor shall be paid: (a) for the Work performed to date including Overhead and profit; (b) for all demobilization costs and costs incurred as a result of the termination but not including Overhead or profit on Work not performed.

11.4.3 If the Owner terminates this Agreement, the Constructor shall:

(a) execute and deliver to the Owner all papers and take all action required to assign, transfer, and vest in the Owner the rights of the Constructor to all materials, supplies and equipment for which payment has been or will be made in accordance with the

Contract Documents and all subcontracts, orders and commitments which have been made in accordance with the Contract Documents;

(b) exert reasonable effort to reduce to a minimum the Owner's liability for subcontracts, orders, and commitments that have not been fulfilled at the time of the termination;

(c) cancel any subcontracts, orders, and commitments as the Owner directs; and

(d) sell at prices approved by the Owner any materials, supplies, and equipment as the Owner directs, with all proceeds paid or credited to the Owner.

11.5 CONSTRUCTOR'S RIGHT TO TERMINATE

11.5.1 Upon seven (7) Days' written notice to the Owner, the Constructor may terminate this Agreement if the Work has been stopped for a thirty (30) Day period through no fault of the Constructor for any of the following reasons:

11.5.1.1 under court order or order of other governmental authorities having jurisdiction;

11.5.1.2 as a result of the declaration of a national emergency or other governmental act during which, through no act or fault of the Constructor, materials are not available; or

11.5.1.3 suspension by the Owner for convenience pursuant to section 11.1

11.5.2 In addition, upon seven (7) Days' written notice to the Owner, the Constructor may terminate this Agreement if the Owner:

11.5.2.1 [DELETED]; or

11.5.2.2 assigns this Agreement over the Constructor's reasonable objection; or

11.5.2.3 fails to pay the Constructor in accordance with this Agreement and the Constructor has complied with section 9.5; or

11.5.2.4 otherwise materially breaches this Agreement.

11.5.3 Upon termination by the Constructor in accordance with section 11.5, the Constructor shall be entitled to recover from the Owner payment for all Work executed and for any proven loss, cost, or expense in connection with the Work, including all demobilization costs plus reasonable Overhead and profit on Work not performed.

11.6 OBLIGATIONS ARISING BEFORE TERMINATION Even after termination, the provisions of this Agreement still apply to any Work performed, payments made, events occurring, costs charged or incurred or obligations arising before the termination date.

ARTICLE 12 DISPUTE MITIGATION AND RESOLUTION

12.1 WORK CONTINUANCE AND PAYMENT Unless otherwise agreed in writing, the Constructor shall continue the Work and maintain the Schedule of the Work during any dispute mitigation or resolution proceedings. If the Constructor continues to perform, the Owner shall continue to make payments in accordance with this Agreement.

12.2 DIRECT DISCUSSIONS If the Parties cannot reach resolution on a matter relating to or arising out of this Agreement, the Parties shall endeavor to reach resolution through good faith direct discussions between the Parties' representatives, who shall possess the necessary authority to resolve such matter and who shall record the date of first discussions. If the Parties' representatives are not able to resolve such matter within five (5) Business Days from the date of first discussion, the Parties' representatives shall immediately inform senior executives of the Parties in writing that resolution was not affected. Upon receipt of such notice, the senior executives of the Parties shall meet within five (5) Business Days to endeavor to reach resolution. If the dispute remains unresolved after fifteen (15) Days from the date of first discussion, the Parties shall submit to the Dispute Resolution procedure in paragraph 12.3.

12.3 Dispute Resolution: All disputes, claims, or other matters relating to this Contract shall be submitted by the Constructor in writing to the Owner (University's Vice President for Strategic Infrastructure Planning and Facilities or designee) to review. Raised claims must be presented to the Owner's representative within 30 days of when the Constructor knows or should have known of the issue in controversy. This informal dispute process is in place to precede any formal litigation. If the Constructor is not satisfied with the outcome of the review, a dispute may be filed for resolution with the court of competent jurisdiction in Michigan. Claims and any appeals by the Constructor affecting the fee payment must be made before submitting the request for final payment. Unless otherwise instructed by the Owner, the Constructor shall continue to Work under this Contract without delaying the Project, or any portion thereof, pending the outcome of the dispute, claim, or question.

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ARTICLE 13 MISCELLANEOUS

13.1 EXTENT OF AGREEMENT Except as expressly provided, this Agreement is for the exclusive benefit of the Parties, and not for the benefit of any third party. This Agreement represents the entire and integrated agreement between the Parties, and supersedes all prior negotiations, representations, or agreements, either written or oral.

13.2 ASSIGNMENT Except as to the assignment of proceeds, the Parties shall not assign their interest in this Agreement without the written consent of the other. The terms and conditions of this Agreement shall be binding upon both Parties, their partners, successors, assigns, and legal representatives. Neither Party shall assign the Agreement as a whole without written consent of the other.

13.3 GOVERNING LAW This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan; provided, however, no conflict of laws rule applicable in Michigan that would require the application of the laws of any other jurisdiction shall apply.

13.4 SEVERABILITY The partial or complete invalidity of any one or more provisions of this Agreement shall not affect the validity or continuing force and effect of any other provision.

13.5 NO WAIVER OF PERFORMANCE The failure of either Party to insist, in any one or more instances, on the performance of any of the terms, covenants, or conditions of this Agreement, or to exercise any of its rights, shall not be construed as a waiver or relinquishment of such term, covenant, condition, or right with respect to further performance or any other term, covenant, condition, or right.

13.6 TITLES The titles given to the articles are for ease of reference only and shall not be relied upon or cited for any other purpose.

13.7 JOINT DRAFTING The Parties expressly agree that this Agreement was jointly drafted, and that both had opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms prior to execution. Therefore, this Agreement shall be construed neither against nor in favor of either Party, but shall be construed in a neutral manner.

13.8 RIGHTS AND REMEDIES The Parties' rights, liabilities, responsibilities and remedies with respect to this Agreement, whether in contract, tort, negligence or otherwise, shall be exclusively those expressly set forth in this Agreement.

13.9 NONDISCRIMINATION AND INCLUSION

13.9.1 In performing under this Contract, the Contractor shall not discriminate against any employee, or applicant for employment, with respect to hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height or weight, marital or familial status or disability. Subcontracts with each Subcontractor will contain a provision requiring nondiscrimination in employment, as herein specified. Any breach of this covenant may be regarded as a material breach of this Contract.

13.9.2 The University makes a continuous effort to broaden its business relationships with Minority Business Enterprise (MBE) contractors, Women Business Enterprise (WBE) contractors, and small business concerns (including veteran-owned small business, service-disabled veteran owned small business, HUB Zone small business, and small disadvantaged business concerns certified by the U.S. Small Business Administration). For the purposes of this provision, suppliers are considered subcontractors. If third parties are needed to fulfill contractual obligations, Contractors are strongly encouraged to consider all qualified sources, including WBE, MBE, and small business subcontractors. For purposes of this paragraph, MBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by individuals who are members of a minority and with respect to which more than 50% of the net profit or loss attributable to the business accrues to shareholders who are members of a minority. WBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by women and with respect to which more than 50% of the net profit or loss attributable to the business accrues to the women shareholders.

13.10 PREVAILING WAGE AND FRINGE BENEFIT RATES

13.10.1 The rates of wages and fringe benefits to be paid to each class of mechanics by the Contractor and all Subcontractors or Sub-subcontractors shall be not less than the wage and fringe benefit rates prevailing in the locality in which the Work is to be performed in effect upon award of the contract. Prevailing wage and fringe benefit rates shall be determined in accordance with the schedules published periodically by the Michigan Department of Consumer and Industry Services pursuant to Act No. 166, Public Acts of 1965. A copy of the rate schedule in effect for this project is attached for convenience of reference. The term "Contractor" shall include all lessors, general contractors, prime contractors, project managers, or trade contractors, and all of their contractors or subcontractors and persons in privity of contract with them.

13.10.2 Every Contractor, Subcontractor, or Sub-subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates applicable to any Work being done as part of the Project, and the address and telephone number of the Michigan Department of Consumer and Industry Services, and shall keep an accurate record showing the name and occupation of and the actual wages and fringe benefits paid to each construction mechanic and apprentice employed in connection with the Contract.

13.10.3 The Contractor's, and Subcontractors', and Sub-subcontractors' records of wages and fringe benefits paid shall be available for reasonable inspection by the Owner. The Contractor shall maintain and, at the Owner's request, the Contractor shall provide to the Owner, a certified payroll record for the Project, for all labor on site, for a minimum of one year following completion of the Project. The information shall be provided on U.S. Department of Labor form WH-347 or a similar format.

13.10.4 In the event of omission of any trade from the list of wage and fringe benefit rates to be paid to each class of mechanics by the Contractor, Subcontractors, or any Sub-subcontractors the trades omitted shall also be paid not less than the wage and fringe benefit rates prevailing in the locality in which the Work is to be performed.

13.10.5 In the event the Contractor, Subcontractor, or a Sub-subcontractor is found in violation of the prevailing wage requirements of the Contract, the Owner shall withhold further payments to the Contractor until the Contractor or Subcontractor satisfies the reported underpayment or the determination is reversed at a review conducted upon the request of the Contractor or Subcontractor.

13.11 SEXUAL HARASSMENT POLICY

13.11.1 The Contractor shall assure that it, its employees and agents, all Subcontractors and their employees and agents, and all Sub-subcontractors and their employees and agents are aware of and comply with the Owner's policy prohibiting sexual harassment in the performance of this contract. Copies of this policy are available at the Engineering and Architectural Services Division, Purchasing Department.

13.11.2 The Contractor shall act promptly to stop any violation of the policy by any such persons, by removing the violator from the site or otherwise. Failure by the Contractor to promptly investigate complaints and take appropriate action to address violations of the policy shall be deemed a material breach of the Contract.

13.12 CRIMINAL BACKGROUND CHECKS

13.12.1 The University strives to provide a safe and enjoyable environment for its students, faculty, staff, and visitors in support of its educational mission. In support of that goal, the University has set forth criminal background check requirements for specified University contractors. The policy requirements are available upon request or at the following websites:

MBP: https://usd.msu.edu/mbp/mbp-270/index.html (fourth paragraph down applies to the background checks)

On our For Suppliers page https://usd.msu.edu/for-suppliers/criminal-background-check/index.html

Policy: https://usd.msu.edu/common/documents/criminal-back-ground-check.pdf

13.12.2 These requirements apply to the following University contractors and their consultants:

13.12.2.1 Direct delivery vendors and equipment service providers that work in or have access to any campus residential facility or any facility that is regularly used by children.

13.12.2.2 Contractors working on construction projects in occupied campus residential facilities or the T.B. Simon Power Plant.

13.12.2.3 Contractors who maintain a regular presence on campus and whose duties require them to work in campus residential facilities; handle cash, credit cards, or other

sensitive financial information; or have access to MSU IT networks or computer systems other than the MSU Guest Wireless system or an MSU email account.

ARTICLE 14 CONTRACT DOCUMENTS

14.1 EXISTING CONTRACT DOCUMENTS

The Contract Documents in existence at the time of execution of this Agreement are as follows:

(a) Drawings: [_____]
(b) Specifications: [_____]
(c) Addenda: [_____]

(d) Other: [_____]

14.2 INTERPRETATION OF CONTRACT DOCUMENTS

14.2.1 The drawings and specifications are complementary. If Work is shown only on one but not on the other, the Constructor shall perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them.

14.2.2 In case of conflicts between the drawings and specifications, the specifications shall govern. In any case of omissions or errors in figures, drawings, or specifications, the Constructor shall immediately submit the matter to the Owner for clarification. The Owner's clarifications are final and binding on all Parties, subject to an equitable adjustment in Contract Time or Contract Price or dispute mitigation and resolution.

14.2.3 Where figures are given, they shall be preferred to scaled dimensions.

14.2.4 Unless otherwise specifically defined in this Agreement, any terms that have well-known technical or trade meanings shall be interpreted in accordance with their well-known meanings.

14.2.5 ORDER OF PRECEDENCE In case of any inconsistency, conflict, or ambiguity among the Contract Documents, the documents shall govern in the following order: (a) Change Orders and written amendments to this Agreement; (b) this Agreement and General Conditions; (c) subject to subsection 14.2.2 the drawings (large scale governing over small scale), specifications and addenda issued prior to the execution of this Agreement or signed by both Parties; (d) information furnished by the Owner pursuant to subsection 3.13.4 or designated as a Contract Document in section 14.1; (e) other documents listed in this Agreement. Among categories of documents having the same order of precedence, the term or provision that includes the latest date shall control. Information identified in one Contract Document and not identified in another shall not be considered a conflict or inconsistency.

OWNER: **MICHIGAN STATE UNIVERSITY**

BY: _____ NAME: _____TITLE: _____

WITNESS: _____ NAME: _____TITLE: _____

CONSTRUCTOR: [_____]

BY: _____ NAME: _____TITLE: _____

WITNESS: _____ NAME: _____TITLE: _____

END OF DOCUMENT.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. Work Under This Contract

1. This Contract encompasses the furnishing of all labor, materials, services, equipment, and insurance to complete the following as shown on drawing and specified herein:

   a. This project involves improvements to 8 different stormwater outlet headwalls that discharge into the Red Cedar River and the replacement of the adjoining storm sewer connections.

2. Any premium time necessary to complete this project as scheduled, shall be included in the Base Bid.

3. All pertinent requirements of the Invitation to Bidders, Instructions to Bidders, and General Conditions shall form a part of these specifications and the Contractor shall consult them in detail for instructions pertaining to the work in the following divisions.

B. Work Performed Under Separate Contracts

1. The following will be provided by the Owner or by others under separate contracts:

   a. Tie-back, pruning, removal and/or transplanting of existing plantings and/or trees.

   b. Restoration of disturbed areas utilitzing native seed mixes, erosion control blanket, straw wattles, and native shrub plantings.

   c. Traffic & Pedestrian Control

   d. As-built Site Survey

      1) The Contractor shall notify the Project Representative when new underground utility installation starts, or when existing utilities are exposed, to allow the Project Representative to coordinate with IPF Facility Information Services for documentation.

      2) The Project Representative shall coordinate with IPF Facility Information Services for an As-built Survey upon completion of exterior improvements and utilities.

2. Coordinate pickup of the following site-related, owner-provided materials from Beaumont Supply at 4080 Beaumont Rd., Lansing, MI 48910, phone: (517) 643-6253 (Hours of operation are May 1st – October 31st 6am-4pm Monday – Friday excluding university holidays. November 1st – up until the Thanksgiving Holiday 6am-230pm Monday -Friday and following Thanksgiving Holiday – April 30th 5am-130pm to accommodate for snow) Extended hours are available with a minimum 24-hour notice. Contractor is responsible for transporting materials to the jobsite.

    a. Soil Erosion and Sedimentation Control (SESC) materials: (removed and retained by Owner at end of permit)

        1) Silt fence. Contractor to purchase and retained by MSU.

        2) Turbidity curtain. Contractor to purchase and retained by MSU.

    b. Topsoil, final grading, fertilizing, mulching, and seeding of construction site. (see Section 312300). Approximately 100 cubic yards of topsoil are needed.

    c. Broken concrete for retailing wall (see Section 323219). Approximately 10 cubic yards are needed.

    d. Site Appurtenances (see Section 324000):

        1) Barrier-free parking bollards, removable bollards, guard post bollards, Post and chain fence

C. Pre-Ordered Products

1. The Contractor shall assume full responsibility for all pre-ordered products after their arrival at MSU. This includes transportation, handling, storage, start-up, warranty services, and installation in accordance with the General Conditions unless otherwise specified.

D. Work Sequence

1. The construction start date for this project is May 4, 2026.

2. The Substantial construction completion date for this project is August 21, 2026. Which includes all work for the contractor and the restoration work from MSU – Landscape Services. Contractor shall provide MSU – Landscape Services 2 weeks minimum to perform the restoration work prior to the Substantial Completion date.

1.2 WORK RESTRICTIONS

A. Access Routes

1. Contractor shall choose access routes that minimize impact to pedestrian traffic and

impacts to existing infrastructure.

B. Owner Occupancy

1. Unless otherwise stated, University building entrances will continue to function and remain accessible during the construction process.

2. On every project involving new construction, additions or alterations to existing facilities, M.S.U. requires the ability of a person with physical disabilities to independently get to, enter, and use the site, facility, building or element. In no way shall a site, building or facility be restricted to individuals with disabilities, due to alterations or construction, which would normally be made accessible to individuals with no disabilities. Alternate routes for all new and alterations of existing facilities shall incorporate the latest federal, state and local barrier free standards and include temporary access accommodations for individuals with disabilities.

C. Use of Site

1. There shall be a pre-construction site walk-thru with the Project Representative to clarify and discuss limitations and concerns prior to construction.

2. Construction fence

a. A construction fence shall be placed around each construction site as needed for public safety and as approved by the Project Representative.

b. The Contractor is responsible for installing and maintaining the construction fence and gates to restrict access by the public to the area under construction. The Contractor may be required to reposition the fence and/or gate(s) during the course of construction to accommodate the construction activities in order to minimize the inconvenience to the public.

c. The fence shall be constructed of chain link fabric with a minimum height of 6', with metal or wood posts at not to exceed 8' spacing. Fence fabric shall be supported by either a top bar or tension cable. Gates (where specified) will be constructed of a suitable metal frame with chain link fabric with a height of not less than 6'. This fence shall be installed before work commences.

d. Metal signs reading "Construction Area - Keep Out" must be attached to the fence at not more than 20' spacing and to the gate(s).

e. Where any fence crosses an existing walk, drive, or road, a lighted MDOT Type 1 barricade or larger shall be attached to the inside of the fence facing on-coming pedestrian and/or vehicular traffic.

f. No construction work, parking, storage of materials or related activities shall occur beyond this boundary fencing.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 PROPOSAL QUOTATION REQUIREMENTS

A. Projects to be bid will be quoted as required by the front-end documents on the specification.

1.2 ALLOWANCES

A. An allowance of $10,000 for soil compaction testing, as defined in section 312300 and elsewhere in this specification shall be included with the base bid.

1.3 UNIT PRICES

A. Unit prices will be used to adjust the Lump Sum Bid for work that is added to or subtracted from the project. Unit prices quoted shall include all associated work items required to complete the task specified and shall include all labor fringes, overhead, profit, handling fee and any associated cost related to the work item. Unit prices must be reasonable and customary for the work specified. The successful bidder must be able to support and document the prices quoted as they relate to the quoted Base Bid. ALL UNIT PRICES MUST BE PROVIDED FOR THE BASE BID TO BE CONSIDERED VALID. CONTRACTOR SHALL PROVIDE THEIR UNIT PRICES IN THE PROPOSAL FOR GENERAL CONSTRUCTION FORM FOLLOWING THIS SECTION.

1.4 CONTRACT BREAKDOWNS

A. Within twenty-four (24) hours after receipt of Bids, the apparent Low Bidder shall submit to the Architect/Engineer, the following:

1. A Schedule of Values (SOV), indicating the cost of each specified Division and/or Major Subdivision of the Bid. The approved SOV will be used as the basis for estimating partial payments to the Contractor when allowed per the front-end documents.

    a. All contracts shall assign a minimum of 1% of the contract value for final completion and project closeout. This item must be identified as a separate line item labeled *Closeout* on the SOV. Exceptions must be approved by the Construction Superintendent.

    b. Due to changes to Generally Accepted Accounting Practices, environmental remediation must be separately reported in the Owner’s financial statements. Accordingly, all contracts shall carry remediation costs in separate lines clearly marked *remediation*. These titles should not be used in other line descriptions.

    c. Construction Management contracts shall carry separate detail lines for at least the following lines:

i. Preconstruction Services
ii. Construction phase staffing
iii. General conditions
iv. Bonds and Insurance. Note that subcontractor bonds are not required to be separately listed.
v. Fee
vi. Closeout

2. Identify a Subcontractor for each Division and/or Major Subdivision for the Owner's approval. Once approved, no Subcontractors will be changed without the Owner's written consent. The List of Subcontractors will have indicated the MBE/WBE Contractors and their percentages of the Contract Price as specified in the "Cover Letter" or "Advertisement for Bids" of this project.

3. A list of representatives authorized to perform Unifier functions on behalf of the Contractor using the Unifier System - Vendor Information available at http://ipf.msu.edu/index.cfm/capital-project-procedures/documents/unifier-system-vendor-information/.

1.5 CONTRACT MODIFICATION PROCEDURES

A. Change Management Quotation Requirements

1. Quotations for changes in the Contract will be submitted via Unifier when requested, as outlined in Section 012000-1.5.B, Change Management Procedures. This section will not prohibit the Project Representative from requesting and receiving verbal quotations. It is intended that mutual cooperation will keep any changes to an absolute minimum. The Contractor shall promptly document any verbal request by initiating a Change Management or Change Request record in Unifier. The Contractor shall not engage in added work without proper authorization by the Owner. Any added work the Contractor engages in without authorization shall be at the Contractor's risk. In no event shall the failure of the Construction Representative to initiate a change constitute authorization for the Contractor to proceed with work.

2. The Change Order Quotation Format Form is available on the MSU Capital Project Delivery Procedures website (http://procedures.ipf.msu.edu/index.cfm/capital-project-delivery-procedures/). This Form shall be forwarded to each required Subcontractor, and is recommended as an outline of the information required by this Contract.

3. The Contractor will submit quotations through Unifier, including detailed breakdowns. Upon request, originals of any documents shall be provided to the Owner. The Project Representative will receive quotations from the Contractor only. Subcontractors will submit quotations through the Contractor. All Contractors will submit quotations with information and back-up data as indicated on the quotation form.

B. Change Management Procedures

1. Change Orders shall be issued as required to alter the Contract, (i.e. change the work scope, materials, dates, etc.), in accordance with the General Conditions of the

Contract, and the following procedure:

a. The Contractor or the Project Representative shall initiate a Change Request in the Unifier Project Management System. Each Change Request will consist of only one change item of work.

b. Items brought up by the Department or Contractor shall be reviewed first with the Project Representative.

c. The Architect/Engineer will review the Change Request, and with the Project Representative, will determine the need for an item to be changed in the Contract by Change Order.

d. If the Change Request is approved, the Contractor will receive a request through Unifier to proceed with the work and/or provide pricing, as applicable. Provide a quotation for the item requiring change, unless the Change Request is submitted as a lump sum with a quotation attached

e. The Contractor will submit a quotation for each Change Request item in accordance with the applicable Unifier business process. Overhead and profit shall be applied consistent with the General Conditions.

f. The Project Representative and Architect/Engineer will evaluate the quotations and accept or reject each item quoted. A Change Order will be created within the Unifier system and will be issued through the MSU Purchasing Department to change the contract amount if required.

g. The Construction Supervisor or Director of Planning, Design and Construction has approval authority for the Contract Change.

1.6 CONTRACT PAYMENT PROCEDURES

A. Payment application requirements
1. Payment applications shall be submitted in Unifier, consistent with the contract documents.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

Storm Sewer - River Outfall Structural Repairs
CP-21037
Owner: Michigan State University - IPF
Engineer: GEI Consultants

Proposal for General Construction					
Line Item	**Item Description**	**Quantity**	**Unit**	**Unit Price**	**Total**
1	Mobilization, Bonds, Insurance	1	LSUM		
2	12" C76 IV RCP Storm Sewer	64	LF		
3	18" C76 IV RCP Storm Sewer	32	LF		
4	27" C76 IV RCP Storm Sewer	16	LF		
5	12" Precast Outlet Headwall	4	EA		
6	30" Precast Outlet Headwall	1	EA		
7	Riprap Over Geotextile Fabric, 8-12"	50	SYD		
8	Marmac Coupler, <18"	5	EA		
9	Marmac Coupler, >18"	2	EA		
10	Encase Pipe Joint in Concrete, <24"	6	EA		
11	Encase Pipe Joint in Concrete, >24"	1	EA		
12	Mortar Existing Pipe Joints	1	EA		
13	Remove Sediment Inside Pipe	1	CYD		
14	Remove Concrete Headwall	20	CYD		
15	Existing Headwall, Adj	2	EA		
16	Urbanite Retaining Wall Repair	1	LSUM		
17	Remove Storm Sewer, <24"	100	LF		
18	Remove Storm Sewer, >24"	16	LF		
19	Remove & Replace Fence, Chain Fence	40	LF		
20	Remove & Replace, 6" Concrete Sidewalk	100	SYD		
21	Remove & Reinstall Emergency Pedestal	1	LSUM		
22	6-Inch Topsoil, Supplied by MSU, Placed by Contractor	800	SYD		
23	SESC, Silt Fence	360	LF		
24	SESC, Turbidity Curtain	400	LF		
25	Outlet Headwall Anchor	10	EA		
26	Material Testing - Soil Compaction, Concrete, Etc.	1	ALLOWANCE	$10,000	$10,000

Total: _____

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

A. Project Meetings

1. Project meetings may be called as deemed necessary by the Project Manager.

B. Project Scope Documentation

1. The Contractor shall use PlanGrid for coordination of changes in the field, punch list items, and potential use for plan review comments.

C. Project Coordination

1. The Contractor is ultimately responsible for coordination to complete all work shown on drawings and specified herein independent of the location of the work on drawings and within the specifications. The arrangement of work within the specification into Divisions and Sections shall be considered as given for convenience of reference only and shall not be held to conform to jurisdictional rules which may prevail in any particular trade. It shall be the responsibility of the Contractor to so arrange or group items of work under a particular trade to conform to the prevailing customs of that trade and best interest of the Owner. Specific items of work will be performed by specific subcontractors or workmen when so specified herein or subsequently deemed necessary by the Project Representative to produce competent results.

2. The Contractor shall lay out the work and be responsible for all lines and measurements of the work. Before ordering material or executing work the Contractor shall obtain field measurements and prepare the work to fit conditions properly.

3. The Contractor will be held responsible for any error resulting from his/her failure to verify the figures shown on the drawing before laying out the work.

4. No extra charge will be allowed on account of slight variations between field dimensions and dimensions given on the drawings.

D. Mechanical and Electrical Coordination

1. Connection to Existing Equipment

a. The Contractor shall make arrangements with Planning, Design and Construction, through the Project Representative, before connecting to existing facilities. Unless otherwise noted, if interruption of service is required it shall be done at the convenience of the Owner.

1.2 CONSTRUCTION PROGRESS DOCUMENTATION

A. Construction Schedule Development/Coordination Responsibilities.

1. A simple bar chart construction schedule shall be prepared by the Contractor and initially submitted to the Owner prior to or at the first Pre-Construction Meeting.

2. The Construction Schedule shall include without limitation, milestones, shop drawing submittals with time allowed for Owner approval, procurement and construction of all major items of work, depicted in weekly increments.

3. The Contractor shall submit updates to the Construction Schedule on no less than a monthly basis and shall submit updates with each Application for Payment, as required by paragraph 3.10 of the Conditions of the Contract.

4. The Contractor shall coordinate its work with the Owner and other Subcontractors and shall cooperate with other Subcontractors by utilizing orderly progress toward completion in accordance with the work scheduled.

1.3 MILESTONE SCHEDULE REQUIREMENTS

A. The following Milestone Schedule dates for the listed work are provided as part of the contract requirements.

MILESTONE ACTIVITY	START	COMPLETION
Submittals	2/1/2026	4/1/2026
Construction	5/4/2026	8/21/2026

1.4 SUBMITTALS

A. Submittal Schedule

1. Concurrently with the development of the Contractor's Construction Schedule, the Contractor shall prepare a complete schedule of submittals. Submit the initial Submittal Schedule along with the Construction Schedule, at, or prior to, the Pre-Construction Conference.

a. Coordinate the Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products, as well as the Contractor's Construction Schedule.

b. Prepare the schedule in chronological order. Provide the following information:
- Scheduled date for the first submittal
- Related section number or specification number
- Submittal category (Shop Drawing, Product Data, Calculations, Test Results or Samples.
- Name of the subcontractor
- Scheduled date for resubmittal
- Scheduled date for completion of the A/E's review

2. Distribution: Following the Owner's response to the initial submittal, print and distribute copies to the Project representative, A/E, Owner, subcontractors, suppliers and other parties required to comply with the submittal dates indicated. Keep copies at the Project Site at all times.

    a. When revisions are made, distribute to the same parties and post at the same locations. Delete parties for distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

3. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting, or as requested by the Project Representative.

B. Submittals are required for, but are not limited to, each of the following. The Contractor should refer to each of the following referenced sections for additional requirements of each submittal. All submittals are to be processed electronically using Unifier.

1. GENERAL SUBMITTALS
   Section 012000 for Contract Breakdowns
   Section 013000 for Safety Documentation
   Section 017000 for FADE Log

2. PRODUCT SUBMITTAL SUMMARY

   Reinforced Concrete Pipe
   Precast Concrete Outfalls
   Platipus Anchor & Anchor Head Assembly
   Marmac Coupler
   Geotextile Fabric
   Speed Dowel Assembly
   Concrete Mix
   Asphalt Expansion Joint
   Sidewalk Wire Mesh
   Silt Fence

3. AS-BUILT DRAWINGS
   As-built Drawings are required as specified in Section 017000.

4. CERTIFICATES OF INSPECTION
   Certificates of Inspection are required as specified in Section 017000.

7. SHOP DRAWINGS
   Shop drawings are required as specified in Section 013000 for the following items:

   Section 334000 for Precast Concrete Outfalls
   Section 314200 for Platipus Anchor & Anchor Head Assembly

8. TEST AND BALANCE REPORTS
   Test and balance reports are required for soil density and concrete testing as specified in Section 014000 – Quality Control.

C. Shop Drawings and Samples

1. The Contractor shall review, stamp with their approval, and submit via the Unifier Submittal process to the Project Representative all Shop Drawings and Samples asked for in these specifications, or deemed necessary by the Architect/Engineer.

2. Work will not begin on any item requiring Shop Drawings or samples until the Contractor receives approval in writing from the Architect/Engineer. Any material or item, ordered or fabricated prior to final approval shall be at the Contractors' risk. No changes shall be made on the approved drawings or samples without the written consent of the Architect/Engineer. Each Shop Drawing or Sample shall be properly identified as to MSU project title and number, Contractor, item, etc., with cover sheet, stamp, tag, etc., so as not to be confused with any other. The Contractor shall direct specific attention with written explanation to any deviation from what is specified or shown on the drawing.

D. Shop Drawings

1. The Shop Drawing will be identified by job name, date, Contractor name and name of person reviewing for compliance with Contract Documents. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared by the Contractor to illustrate some portion of the Work for which submittals are required by the Contract Documents. The purpose of their submittal is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

2. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Owner all Shop Drawings required by the Contract Documents. Submittal shall be with reasonable promptness and in such sequence as to cause no delay in the Work or in activities of the Owner or their separate Contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Owner without action.

3. By approving and submitting Shop Drawings the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4. The Owner will review and approve or take other appropriate action on the Shop Drawings submitted by the Contractor only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract

Documents. Review of Shop Drawings is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Owner's review shall not constitute approval of safety precautions or, unless otherwise stated by the Owner, of any construction means, methods, techniques, sequences or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

E. Samples

1. Samples shall be submitted as directed to provide a representative sample. Samples shall be physical examples, from the actual materials, to be used whenever practical. All packing and transportation charges on samples shall be paid by the Contractor.

2. A Submittal record shall be created in Unifier for each sample, indicating the manufacturer and specifications, and informing the Owner of the status of delivery of the physical sample. The physical sample will be retained by the Owner. The Submittal record will be returned to the Contractor with a review status by the Owner.

3. Approval of Samples shall be generally for quality, color, and finish, and shall not modify the requirements of any of the Contract Documents as to dimensions or design.

1.5 SPECIAL PROCEDURES

A. Constructor Safety Requirements

1. MIOSHA regulations apply to all university projects. Each constructor is responsible for ensuring compliance with "all applicable requirements" that govern their work, including any additional regulations, interpretations, clarifications, and consensus standards incorporated therein by reference.

2. MSU-specific safety requirements are published in the Constructor Safety Requirements Manual. The most current version of this manual is available at http://www.ehs.msu.edu/contractors. Constructors will be held to the version of the manual in effect at the time of contract execution.

3. Requirements specific to work at Michigan State University generally fall into one of two categories:

    a. Administrative Requirements, such as but not limited to communication, planning, documentation, submittals, notifications, reporting, and inspections.

    b. Safety Requirements unique to work at MSU, such as but not limited to Control of Hazardous Energy/Lock Out Tag Out, Confined Space, Electrical, Excavations, Fall Protection, Hot Work, etc.

4. Constructor shall submit a Site-Specific Safety Plan or work under an existing Area-Specific Safety Plan where allowed, as described in the MSU Contractor Safety Requirements Manual.

B. Hazardous Materials

1. If the Contractor suspects a material, preexisting or newly discovered, within the scope of this project to be a hazardous material such as, asbestos, lead, polychlorinated biphenyl or any other potentially hazardous material, that has not already been identified and/or in the scope of work for the Contractor to abate, notify the Project Representative immediately. Do not impact or disturb the material in question until it has been determined to either be non-hazardous, included in the original scope of work, or until other arrangements can be made with the project representative and the MSU Department of Environmental Health and Safety (EHS).

2. Due to the age of buildings on the Michigan State University campus, all coated surfaces shall be assumed to contain lead-based paint. This includes but is not limited to any type of paint, primer, coating, lacquer, or varnish on any building component. Proper precautions must be taken to ensure that workers and building occupants are not exposed to airborne lead concentrations at or above the OSHA Action Level (AL) of 30 ug/m3.

3. If work will be conducted on any coated surface at MSU, the contractor must submit to the Department of Environmental Health and Safety (EHS) and Infrastructure Planning and Facilities Project Representative current proof of appropriate detailed written lead work plan in accordance with 29 CFR § 1926.62 (Michigan Part 603). This submittal will include proof of training, written respirator program, and negative exposure assessments from projects with similar conditions at a minimum. Contractors performing work on campus must follow the provisions of the MSU Lead Management Program from EHS.

4. Any work that impacts Lead shall comply with the provisions of the MSU EHS Lead Management Plan.

5. Any work that impacts Asbestos shall comply with the provisions of the MSU EHS Asbestos Management Plan.

1.6 Requests for Information

A. Requests for Information (RFI's) shall be processed within PlanGrid, using the RFI business process in the IPF PlanGrid Standardization Guide. Failure to complete the tasks within the Plangrid time frames shall not be a basis for a delay claim.

PART 2 – PRODUCTS
Not Used

PART 3 – EXECUTION
Not Used

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 REGULATORY REQUIREMENTS

A. Applicable Codes, Standards, and Regulations

1. The following list of codes and regulations, establish the minimum requirements applied to work done at MSU. Where the specifications or plans, exceed the applicable code, the specifications and plans shall be followed.

a. NFPA National Fire Codes.
b. NFPA National Electrical Code.
c. ICC International Building Code.
d. ICC International Plumbing Code.
e. ICC International Mechanical Code.
f. State of Michigan Elevator Safety Act - Act 227, P.A. 1967.
g. State of Michigan Boiler Act - Act 290, P.A. 1965.
h. State of Michigan Construction Code Act - Act 230, P.A. 1972, as amended.
i. State of Michigan Occupational Safety and Health Act - Act 154, P.A. 1974, as amended.
j. Americans With Disabilities Act (ADA) Public Law 101-336.
k. Regulations of Air Pollution Control Commission State of Michigan, and the Federal Clean Air Act (42 U.S.C. 1857C - 8 © (1)).
l. Soil Erosion and Sedimentation Control - Act 451 of 1994, parts 31 and 91, as amended.
m. Environmental Impact Statement Executive Order 1974-4.
n. State Fire Safety Board's New Rules for Schools, Colleges, and Universities.
o. State of Michigan Safe Drinking Water Act, P.A. 339 of 1976, and Federal Water Pollution Control Act (33 U.S.G. 1319 ©).
p. State of Michigan Energy Code (Adopting ASHRAE 90 by reference).

1.2 REFERENCES

A. Abbreviations and Symbols

1. AIA - American Institute of Architects
2. ACI - American Concrete Institute
3. AISC - American Institute of Steel Construction
4. ANSI - American National Standards Institute
5. ASTM - American Society for Testing Materials
6. BOCA - Building Officials and Code Administrators
7. LEED - Leadership in Energy and Environmental Design
7. NFPA - National Fire Protection Association
8. OSHA - Occupational Safety and Health Act
9. SMACNA - Sheet Metal and Air Conditioning Contractors National Association
10. MDOT - Michigan Department of Transportation

11. USGBC - U.S. Green Building Council

1.3 QUALITY CONTROL

A. Testing Laboratory Services

1. All work (materials and installation procedure) shall be tested and inspected by an independent testing and inspection agency, approved by the Project Representative to provide the quality control requirements in accordance with these specifications. Results of these tests and inspections when performed in accordance with these specifications will not be disputed by either party. Failure of the Contractor to provide quality control in accordance with this specification may result in the replacement of the work at the Contractor's expense.

B. Contractor’s Responsibilities

1. Submit the name of the proposed testing and inspection agency(s) to the Project Representative for review and approval prior to contracting for such services.

2. Employ and pay the cost of independent testing and inspection as required in this specification. Pay applications from the testing/inspection agency shall be reviewed by the Owner before the Contractor’s pay request for testing/inspection services is approved.

3. Advise the testing and inspection agency sufficiently in advance of the work to be inspected in the field to allow time to schedule personnel and equipment to perform the required inspections. Failure of the work to be inspected shall be the sole responsibility of the Contractor regardless of the fault of the testing and inspection agency.

4. Furnish certificates to authenticate the type and or quality of products furnished for installation as required in these specifications.

5. Shall notify the Project Representative in a timely manner when and where testing is to take place to provide sufficient time for the Project Representative to be in attendance.

C. Testing & Inspection Agency Responsibilities

1. Perform all testing and inspection of the work in accordance with these specifications.

2. Furnish qualified personnel and sufficient equipment in a timely manner when required by the Contractor and/or Project Representative to perform all testing and inspection in accordance with these specifications.

3. Provide written reports (2 copies) in a timely manner of the work tested and inspected. The reports shall include complete material test results and for in-place material, a sketch showing the exact location where the test was taken on the project site.

4. The inspection and testing agency and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, nor to approve or accept any portion of the work.

5. Work will be checked by representatives of the testing agencies as it progresses, but failure to detect any defective work or product will not in any way prevent later rejection when such defect is discovered, nor will it obligate the Owner to final acceptance. When it appears that the work or product furnished is in non-conformance with the Contract Documents, the representative of the testing agency will direct the attention of the Project Representative and Contractor to such non-conformance.

6. Quality control testing items shall include the following:

    a. Soil densities
    b. Proof roll
    c. Concrete testing
    d. Asphalt field testing (density and yield)
    e. Bituminous mix design approval and batch plant verification
    f. Asphalt plant mix verification

D. Authority of the Project Representative

1. May order additional tests and inspection beyond those required, if in their opinion, the subject work may not meet specification. The costs for these tests and inspections shall be borne by the Contractor.

2. May terminate the testing and inspection agency. The Contractor shall then furnish to the Project Representative the name of an additional agency for approval.

3. May perform quality control tests and inspections.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1- GENERAL

1.1 TEMPORARY UTILITIES

A. General

1. The Contractor for the general construction work shall be responsible for all items specified in Section 015000. The Contractor shall install and maintain all items until project is finished and shall remove same and restore areas to their original conditions.

1.2 VEHICULAR ACCESS AND PARKING

A. Parking Regulations

1. Unless otherwise directed, all non-University personnel working on the Campus of Michigan State University are required to park as Visitors. Between 7:00 a.m. and 6:00 p.m., Monday through Friday, Visitors may park only in metered parking spaces or gate controlled parking lots.

2. Commercial permits are available from the Department of Police and Public Safety (355-8440), which will allow parking in specific areas. The cost of a commercial permit is the responsibility of the Contractor.

3. Permits for one day parking in areas reserved for university employees are available to Contractors or their personnel from the Department of Police and Public Safety at the current rate, with a signed note from the Project Representative.

4. Parking permits are not required for vehicles south of Mount Hope Road.

1.3 TEMPORARY BARRIERS AND ENCLOSURES

A. General

1. The Contractor shall provide, install, and maintain necessary temporary barriers, warning signs, and other safety measures to protect the public, property, and plant growth.

2. The Contractor will be required to work within limitations imposed by the University Police and Public Safety Department with respect to vehicular and pedestrian traffic. When approved by the Owner, if it becomes necessary to occupy a traffic lane for **ANY** length of time, proper directional signs, flashers and barricades shall be provided at the Contractor's expense in accordance with the most recent edition of the Michigan Manual of Uniform Traffic Control Devices. The Contractor will replace if damaged or stolen, all barricades, flares, and night protection at Contractor's expense, all being considered as incidental to the work.

B. Dust Control

1. Temporary Partitions

a. The Contractor shall construct necessary temporary partitions to isolate the new work from the existing building.

b. Unless noted otherwise, construct partitions of 2" x 4" wood studs, 16" on center and heavy mil, fire retardant plastic sheeting securely attached so as to keep dust, dirt, and debris from spreading beyond the work area.

2. Return Air Openings

a. The Contractor shall block all return air openings in the work area so that dust will not carry into other areas of the building.

3. Site Dust

a. The General Contractor shall be responsible for eliminating airborne dust in the work area and staging area by application of appropriate mitigation measures, as approved by the Owner.

C. Campus Woody Plant Protection

1. Coordinate all plant protection and site work limits with the Project Representative. SITE WORK CANNOT COMMENCE WITHOUT A PRE-CONSTRUCTION WALK-THROUGH.

All Contractor employees engaged on the project site shall attend, or are expected to have attended, the Contractor Woody Plant Protection Seminar, hosted by MSU's Landscape Services (formerly Grounds Maintenance) Division. This seminar will be presented on an annual basis at a minimum. Coordinate with the Project Representative for times and locations of the seminar(s).

2. Work by Owner

a. Tie-back of existing plantings. Pruning, thinning, and sealing of existing plantings. Root pruning and root protection of exposed roots. Watering of

existing trees under stress. Salvaging of existing small trees, shrubs, and other plant growth that the Owner wishes to retain.

b. Tree protection barricades will be provided by the Owner. Plant damage occurring within installed barricades does not absolve the Contractor from damage assessment.

c. Work shall be performed by MSU Landscape Services Department unless otherwise arranged, as needed to provide either preventative or remedial care to plants on a construction site. Contractor shall immediately contact the Project Representative should "protected plants" be compromised in violation of agreed upon fencing locations and work limits. Failure to communicate promptly could result in 100% damage assessment of fines.

3. Protection of Plantings

a. Protect existing trees and other vegetation indicated to remain in place. Prohibited practices include breaking of branches, scraping of bark, or unauthorized cutting; nailing or bolting into trees or plants; use of trees or plants as temporary support (i.e. for cables); unauthorized filling, excavating, trenching or auguring within the root zone; compaction/driving over the root zone; (see definitions below), storage of any materials or vehicles within the root zone; dumping of construction waste or materials (including liquids); unauthorized removal or relocation of woody plants; removal of tree protection barricades or construction fencing prior to completion of project.

b. Compaction within the root zone is the increasing of the soil density caused by heavy equipment or concentrated foot traffic which significantly alters the soil conditions from that which was present prior to construction.

c. The root zone of a tree is one and a half the distance of plant crown drip line outward from the stem, along undisturbed grade. Should placement of concrete be specified or authorized by the Owner within the root zone, a sulfur application will be applied by the Owner. The Contractor shall notify the Owner at least 48 hours prior to pouring concrete. Trees to receive sulfur shall be identified by Owner.

4. Damage

a. Damage to campus woody plants shall include any of the items indicated in paragraph 3.a above as determined solely by the Owner. The Owner shall evaluate damage and establish proportional fines up to 100% of the value shown below, regardless of the current disposition of the plant.

b. 100% Value Schedule for Campus Trees

1" - 3" caliper	$200/inch
3" - 6" DBH	$290/inch

6" - 9" DBH	$380/inch
9" - 12" DBH	$480/inch
12" - 15" DBH	$670/inch
15" DBH or greater	$960/inch

c. DBH is the tree trunk diameter at breast height.

d. Replacement value for shrubs, vines, and perennials shall be assessed at three times the current market cost of the plant.

e. Alternatives to the above protective measures, or any variations, must be approved by the staff Landscape Architect and the Project Representative. (Measures may include: thinning and root pruning, fertilization, aeration, boring & jacking, hand excavation, supervision by campus arborist, seasonal schedule recommendations.) Alternatives would be based on the specific requirements of the plant species in question, as determined by the staff Landscape Architect.

1.4 TEMPORARY CONTROLS

A. Soil Erosion and Sediment Control (SESC)

1. The Contractor shall comply with all Contract Documents, approved SESC plans, permit conditions and with Parts 31 and 91 of Public Act 451 of 1994. The Owner shall obtain a Soil Erosion and Sedimentation Control (SESC) permit from the appropriate Municipal (MEA) or County (CEA) Enforcing Agency. Permit Fees and MEA/CEA routine inspections will be paid for by the Owner.

2. Prior to beginning any earth change, the Contractor shall retain a DEQ Certified Storm Water Operator (CSWO) to provide the required SESC reports (which include the weekly and storm event reports as well as all follow up reports for both violations and storm event corrections) on the standard DEQ form. The Contractor shall provide the reports to the Owner on a weekly basis, and retain those reports for 3 years.

3. Prior to beginning any earth change, and during the life of the contract, the Contractor shall install and maintain all temporary SESC measures as shown on the Contract Documents, SESC plans, and as directed by the Owner, CSWO, DEQ, or MEA/CEA, until MSU officially takes over responsibility for the site.

4. Immediately prior to MSU taking responsibility for the site, the Contractor:
   a. Will be required to clean all catch basins affected by the construction, both within the Contract Limits and all surrounding roads and lawn areas when soil may have spread as the result of construction activities.
   b. Shall put all temporary SESC measures in satisfactory condition as determined by the CSWO.

5. All temporary SESC measures will remain in place and will become the property of the Owner when responsibility for maintaining the SESC measures becomes the Owner’s

responsibility.

6. The Contractor shall conduct all excavation, filling, grading and clean-up operations in a manner such that sediment generated by wind or water is not discharged off site or into any storm sewer, drainage ditch, river, lake, air or underground utility system. Stage the work per plan to minimize the area of exposed soil, thereby reducing the opportunity for soil erosion.

7. Water from trenches and other excavation shall be passed through an approved filtration bag to remove sediments from the water before it is released into the storm water drainage system.

8. If sediment extends beyond the project limits, the Contractor shall be responsible for cleanup and restoration of all surfaces and utility systems to the condition that existed prior to the Contract award.

9. All SESC measures shall be maintained daily.

10. Should violations (irrespective of a fine being assessed) be identified by the Owner, CSWO, MEA/CEA or DEQ, they shall be corrected within 24 hours of notification. The correction(s) shall be approved by the Owner, CSWO, MEA/CEA or DEQ. All subsequent inspections performed by the Owner, CSWO, MEA/CEA or DEQ as a result of the violation (and any other associated costs) will be paid by the Contractor. If identified violations are not corrected within 24 hours of written notice, the Owner shall have the right to make necessary repairs at the Contractor's expense, without being required to provide further notice to Contractor.

11. Fines assessed as a result of the violation for non-compliance of the SESC provisions, will be paid by the Contractor. If a “Stop Work” order for non-compliance is issued, a time extension request for that time period will **not** be granted. (Fines could be assessed up to and including $25,000/DAY for each violation.)

12. Only one Seven Day Notice will be issued for violations of the SESC provisions. Should subsequent violations be identified, the contractor will be expected to make the satisfactory correction within 24 hours of notification. Should the corrections not be made, the Owner, without further notice to the Contractor, will correct the violation. The cost of the corrective action will be charged to the Contractor.

1.5 CONSTRUCTION DEBRIS CONTROL

A. The Contractor shall provide and administer a system for disposal of construction debris, and shall be responsible for seeing that the site and the new building are at all times free of accumulated debris caused by the construction. For purposes of this paragraph, debris shall include ALL materials used in construction including construction roads and pads. Special attention should be given to materials that could leach into the ground, including but not limited to lime based materials, all chemicals, and any liquids except clean water.

B. The Contractor shall comply with LEED Materials & Resources Credit 2, including

documentation of the Construction Waste materials recycled, reused and sent to the landfill, using the Construction Waste Management form and process provided by the Owner in Unifier. This form shall be submitted monthly, and will be generated from completed payment applications. Negative reports are required.

C. This shall include, but not be limited to, rubbish containers conveniently located throughout the site for the daily disposal of debris directly into them from each work location. Debris shall not be allowed to accumulate on the ground through-out the site overnight.

D. All combustible debris shall be removed to a solid waste disposal site properly licensed under Act 87 of the Public Acts of 1965 of the State of Michigan.

E. No burning of debris will be permitted on the Project site or elsewhere on the Owner's property.

F. Should the Contractor not execute the work required in this section, the Owner reserves the right to perform the work by other forces and deduct the cost from the contract price.

1.6 CONFINED SPACES

A. The workplace may contain permit confined spaces and entry is allowed only through compliance with a confined space program as defined by 29 CFR 1910.146. The contractor is responsible for assessing real or potential atmospheric hazards and other serious safety and health hazards in the confined space. MSU will make available records of known confined space hazards. The contractor shall provide all necessary equipment for confined space entry. If MSU personnel will be working in or near confined spaces occupied by the contractor, the contractor is required to coordinate activities with the Project Representative. The contractor will inform the Project Representative of procedures followed and hazards confronted or created during entry operations.

1.7 LOCK-OUT/TAG-OUT PROCEDURE

A. The Contractor shall conform to Michigan State University Infrastructure Planning and Facilities lock-out/tag-out procedure. Copies are available from Planning, Design and Construction, Infrastructure Planning and Facilities Building, Michigan State University.

1.10 HAZARDOUS SUBSTANCE SPILLS

A. Releases of hazardous substances that pose a significant threat to health and safety, or that, by their very nature, require more than a routine response, are emergency situations. If a release of an emergency nature occurs, call 911 immediately. Provide all applicable information and stay on the phone until told to hang up. If a non-emergency release of a hazardous substance occurs, contact the MSU Infrastructure Planning and Facilities Project Representative immediately.

1.12 CRANE HOISTING

A. Crane hoisting of equipment or materials over occupied spaces shall be performed at the convenience of the Owner, with arrangements made by the Project Representative.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Storage and Protection

1. The Contractor shall be responsible for work, material, and equipment until finally inspected, tested, and accepted. The project shall be protected against theft, injury, and damage. Material and equipment received on the site shall be carefully stored until installation.

B. Staging Area

1. Should the Contractor require exterior staging or on-site storage of materials - the location of this area must be agreed upon prior to actual use of the space by the Project Representative and the Contractor. The area will not be within the drip-line of any tree or in plant beds, as per Section 015000.1.3.D.3.

2. If this exterior area is outside the fenced project site, the area shall be enclosed with a minimum 4' high welded wire fence, with metal fence T-posts not exceeding 8' on center. Fence fabric shall be supported by either a top bar or a tension cable.

3. The Contractor shall be responsible for the cost of placing and removing the fence.

4. Each designated area shall have only one access route from the road or drive.

5. The area is not to be used for employee parking, but may be utilized by the Contractors' vehicles and equipment necessary to service the project.

6. Any areas damaged as a result of the staging operation shall be repaired by the Contractor, at no additional cost to the Owner.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1- GENERAL

1.1 EXAMINATION

A. Pre-Bid Site Inspection

1. Each Bidder shall be held to have visited the site of the proposed work before submitting their proposal and to have familiarized themselves with all existing conditions affecting the execution of the work in this project. No allowance or extra consideration on behalf of the Contractor or Subcontractor will subsequently be made by reason of failure to observe the site conditions.

1.2 PREPARATION

A. Protection of Work and Property

1. Contractor shall protect existing and new work as required by this construction or as requested by the Project Representative.

. Exterior Protection

a. The Contractor shall be responsible for any damage to existing facilities, including but not limited to the following: buildings, trees and shrubs, walks, roads, utility systems, terraces and steps, lights, and unreasonable turf damage as determined by the Project Representative. Damage shall be repaired by the Contractor in accordance with MSU's Construction Standards at no cost to the Owner.

b. No crawler cranes, bulldozers, or other equipment, fitted and running on steel treads, shall be permitted to traverse any walk, road, street, or other thoroughfare on the Campus of Michigan State University. Where it is necessary to unload such equipment on these thoroughfares, and when approved by the Project Representative, planking shall be provided to protect same. If this is not done, and damage is observed, the cost of replacing shall be the burden of the Contractor causing such damage.

b. Staging zones for materials and equipment shall be coordinated with Project Representative. They are to be placed on paved areas where possible. Set-up and storage areas shall be fenced with minimum 6-foot high pedestal-type chain link fencing. Locations shall be reviewed with the Department of Police and Public Safety and approved by the Project Representative.

c. Crane hoist dates shall be coordinated with Project Representative for sufficient notice to building users. Project Representative shall direct the notice to the building users and coordinate with DPPS.

d. Owner may provide temporary access-ways in turf or root zone areas, as determined in pre-construction walk-through. For heavy equipment on turf areas, Alturna mats or approved equal, must be utilized for travel and set-up zones.

e. All electric, telephone, and steam vaults and water valves shall be protected and remain accessible at all times. Heavy equipment shall not be run over the top of vaults or valve boxes, nor shall materials be stored over them.

f. Contractor shall provide lighted barricades if building entrances or pedestrian walks are closed after work hours or on the weekends.

g. Tree pruning, plant tie-back, and vine removal shall be done by the Owner, as coordinated with the Project Representative, and as noted in Section 015000.1.3.D.2.a. Trees or other plant material shall not be used as anchor points for any lines or equipment.

h. Plant protection as directed by the Project representative:

a. Minor work: Plants adjacent to, or below work zones are to be washed off daily. In no case shall masonry dust or other construction debris remain on plants for more than 24 hours.
b. Major work: Plants adjacent to, or below work zones are to be covered with breathable woven mesh tarp. Tarp shall be removed at the end of each day and debris disposed of. Debris and dust shall not be absorbed into soil.

B. Field Engineering

1. Quality Assurance

a. Surveyor

1. Engage a Registered Land Surveyor, registered in Michigan, to perform ALL project surveying, including construction layout, as outlined in Section 017000-1.2.B, "Field Engineering."

2. Submittals

a. Project Record Documents

1. Upon completion of Work requiring Field Engineering, submit a record of Work performed and record survey data as required in Section 017000-1.2.B.5.

2. Upon completion of Work requiring Field Engineering, submit a certificate signed by the Registered Land Surveyor, certifying the location and elevation of improvements comply with the Contract Documents.

3. Control Points

a. The Owner will identify existing control points and property line corner stakes.

b. Verify layout information shown on the Drawings in relation to the property survey and existing benchmarks before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

c. If a discrepancy between the contract drawings and the existing site is found, contact the Project Representative for a resolution BEFORE any actual layout of the work is begun.

d. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

e. Promptly replace lost or destroyed control points. Base replacements on the original survey control points.

f. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.

g. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

h. The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction.

i. Prior to construction, verify the location and invert elevation at points of connection to existing utilities.

4. Benchmarks and Markers

a. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do no scale Drawings to determine dimensions.

b. Advise entities engaged in construction activities of marked lines and levels provided for their use.

c. As construction proceeds, check every major element for line, level, and plumb.

5. Registered Land Surveyor’s Log

a. Maintain a surveyor's log of control and other survey Work. Make this log available for reference.

b. Record deviations from required lines and levels, and **immediately** advise the Project Representative when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.

c. On completion of foundation walls, major site improvements, and other Work requiring field engineering, submit this log and associated Project Drawings to the Project Representative.

6. Existing Utilities

a. Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in or affected by construction.

7. Site Improvements

a. Locate and layout all site improvements including, but not limited to, pavements, structures, earthwork and utility locations and grades.

8. Structure Lines and Levels

a. Locate and layout batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

1.3 EXECUTION

A. Cutting and Patching – Concrete and Masonry

1. The Contractor shall be responsible for any cutting, fitting, and patching that may be required to complete this project.

a. The responsible person for the project shall ensure substantial compliance with the requirements for exposure to Silica Dust. Substantial compliance will also be required for all other construction safety standards and published by the State of Michigan or Federal OSHA.

B. Salvaging of Materials

1. Materials or equipment shown on drawing or specified herein to be removed, which are not to be reused or salvaged, shall become the property of the Contractor and will be removed from University property and disposed of legally.

2. Salvage the following items to the locations as directed:

   a. Post and chain fencing
   b. Emergency Pedestal

1.4 CLEANING UP

A. Cleaning up shall be in accordance with the General Conditions of the Contract.

C. A thorough final cleaning of all of the adjacent streets, as specified by the Project Representative, will be required before final payment is made.

D. If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be charged to the Contractor.

1.5 STARTING AND ADJUSTING

A. Refer to each Division for requirements.

1.6 CLOSEOUT PROCEDURES

A. In general, one or more walk-throughs will be performed with the Contractor and punch lists developed of items to be completed before the project can be closed out.

1.7 CLOSEOUT SUBMITTALS AND PROJECT DELIVERABLES

A. Operation and Maintenance Data

1. The Contractor shall provide operation and maintenance data as required in this specification, and submit the required information through use of the Unifier and PlanGrid systems.

2. Submittals for equipment and systems shall contain the manufacturer's information on installation, balancing, operating, maintenance, lubrication, and repair instructions and parts list for each component.

3. Please refer to MSU Document Submittal Standards and PlanGrid Standardization Guide.

B. As-Built Drawings

1. Submission of all As-built Drawings called for in this specification shall precede request for final payment.

2. The Contractor shall submit As-built Drawings in electronic (.pdf) format, that is not password protected, indicating any deviations from the Contract Drawings, including contract Change Orders. Upon request of the Owner, printed copies of the As-Built drawings shall be provided as well.

3. Provide any Building Information Model (BIM) data developed for this Project to the Project Representative.
4. Please refer to MSU Document Submittal Standards

C. Facility Asset Data Exchange (FADE) Log

1. The Constructor shall furnish all information as indicated on the FADE log spreadsheet. The University's FADE procedure and requirements for asset tracking and populating the log can be found at the following web addresses:

   FADE process during design phase:
   https://us.promapp.com/msu/Process/Minimode/Permalink/BrVwOrmhTRjBaJ5QaaOZKI

   FADE process during construction:
   https://us.promapp.com/msu/Process/Minimode/Permalink/BDKsT36upoGpxJeNiakDkW

   Should the Owner change the FADE process change in form or content, the Constructor is not relieved of fully executing the work required to compile the information and complete the Log.

D. Construction Safety Documentation

1. The Contractor shall provide written documentation of the following site safety information, as it pertains to the project only:

   a. List of all lost time accidents.
   b. Reportable incident rate (total hours worked).
   c. Details of many MIOSHA site visits, including resulting citations, violations, or actions.

E. Certificates of Inspection

1. The Contractor shall provide a copy of all Certificates of Inspection called for in this specification. Refer to Section 013000 Part 1.4.B.

F. Construction Waste Management – LEED Documentation

1. The Contractor shall provide written documentation of the Construction Waste Management program, as required for LEED Materials & Resources Credit 2. A form for this purpose is provided within this specification. Refer to Section 024200, Construction Waste Management.

G. Warranty

A. The Contractor shall provide a written guarantee stating that all work performed and material furnished is free from all defects in workmanship, and material for a period of one year, unless noted otherwise, after the equipment has been accepted by the Owner. Final payment or Certificate of Substantial Completion, whichever is issued first, shall constitute Owner acceptance.

B. Additional warranties are required for site concrete pavement (Section 321313).

H. Final payment

A. The contractor shall provide a sworn statement with final payment. The statement shall detail all subcontractors paid on the project and other information detailed in the link below:

https://api.gis.msu.edu/edms/file/{C500C6DD-E852-11ED-0000-76DDD13A85C5}

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 024113– SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide labor, materials and equipment as necessary to complete work as indicated on the Drawings and specified herein.

B. This section includes the removal of existing structures, fences, pavements, and other items indicated on the Drawings or specified, or both.

C. Related sections include the following:
1. Division 31 Section “Site Clearing.”
2. Division 31 Section “Earthwork.”

1.3 PROJECT CONDITIONS

A. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Project Representative. Provide alternate routes around closed or obstructed traffic ways if required.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 DEMOLITION OPERATIONS

A. At the direction of the Project Representative, certain items within the Project limits may be salvaged by the Contractor to the Owner. Salvaged materials or equipment will be indicated on the Drawings or specified. Salvaged items not indicated or noted to be reinstalled shall be delivered to designated location(s) on campus as directed by Project Representative.

B. Materials to be recycled shall be hauled from the project to Beaumont Landscape Supply, 4080 Beaumont Road, East Lansing MI 48824. Call (517) 884-4880 to coordinate drop-off time and location.

1. Items to be salvaged include, but are not limited to:
a. Post and chain fencing
b. Ornamental fencing and gates
c. Chain link fence
d. Catch basins and manhole frames and covers

e. Bike racks
f. Litter receptacles and ash urns
g. Light fixtures and poles
h. Face brick
i. Paver brick
j. Limestone cap
k. Steel and concrete bollards
l. Irrigation system components, including but not limited to valves, heads, and vacuum breakers

2. Materials to be recycled include, but are not limited to:
   a. Concrete material (pavement, curb and gutter, walls and footings)
   b. Bituminous pavement millings
   c. Topsoil
   d. Clean pavement base aggregate

C. The use of explosives is not permitted.

D. Conduct demolition operations and the removal of debris to ensure minimum interference with adjacent roads, streets, walks, and other facilities, operations and people.

E. Conduct operations to prevent damage by falling debris or other cause to adjacent buildings, structures, vegetation to be retained, and other facilities as well as persons.

F. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Project Representative. Repairs shall be made at no cost to the Owner.

3.2 REMOVAL OF PAVEMENTS

A. Saw cut concrete curb and gutter and flatwork on nearest existing joint beyond area required to be removed as shown on the Drawings.

B. Provide a minimum of 18 inches between the new gutter pan edge and the bituminous paving edge.

3.3 CLEANUP

A. Contractor shall be responsible for disposing debris from demolition and salvage operations. Disposal of debris shall be done legally off the Owner's property, except that specifically requested for salvage by the Project Representative. Burning of debris is not permitted.

B. During demolition operations, keep dust to a minimum using appropriate methods.

C. During demolition operations, access roads and adjacent concrete pathways shall be maintained broom clean. Roads shall be cleaned by using a pick-up type sweeper. A front-end tractor mounted sweeper is not permitted.

D. The site shall be graded to provide surface drainage and shall be left in a clean condition.

END OF SECTION 024113

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. This section shall apply to all Division 26 sections.

1.2 SUMMARY

A. Work Included

1. The work involves removal of the existing Code Blue CB 1-S Emergency Pedestal and reinstallation in the same location. Extreme care should be taken to not damage the pedestal during the removal process.

2. The work shall be executed in conformity with the drawings, the approved shop drawings, and these specifications.

3. In general, this work shall consist of, but not necessarily be limited to the following:
   a. Demolition
   b. New Work

B. Work Not Included

C. The Contractor shall refer to Alternates listed in Division 01 and Proposals and shall submit price quotations for the alternates that apply to the electrical work.

1.3 SUBMITTALS

A. Shop Drawings and Samples

1. The Contractor shall submit shop drawings for all major equipment including, but not limited to the following items and/or the items listed in Division 26 sections.

2. Quantity of shop drawings and information to be included shall be as specified in Division 01 - General Requirements.

B. As-Built Drawings

1. Quantity of shop drawings and information to be included shall be as specified in Division 01 - General Requirements.

2. The Contractor shall submit as-built drawings indicating the location of all outlets, junction boxes, and conduit runs; including conduit size, circuit numbers, and number of wires in each run.

C. Certificate of Electrical Inspection: Provide certificate as described in this section.

1.4 QUALITY ASSURANCE

A. Codes and Regulations

1. See Division 01 General Requirements for Codes and Regulations that apply.

2. The latest National Electrical Code shall be observed and shall govern the character of work, style, quantity and the size of all material used.

3. All materials shall conform with the standards set forth by the State of Michigan in every case where such standards have been established for the particular type of material in question.

4. All material and equipment shall be listed by a "State of Michigan" approved testing agency or lab such as U.L. or ETL. and bear the appropriate label where such listing and labeling exists. Contractors shall refer to the State of Michigan LARA website for a full listing of all state approved testing labs or agencies.

5. The complete electrical installation shall comply with all the requirements of the MI.O.S.H.A.

6. Codes shall be used as minimum requirements, and where the Specifications or Plans call for an installation that exceeds and does not violate the Code requirements, the Specifications and Plans shall be followed.

B. Character of Work

1. The installation shall be executed in a workmanlike manner and shall present a neat mechanical appearance when completed.

2. Contractors working in the T.B. Simon Power Plant shall have a minimum of five years of experience working on like systems in power plants that involved in this project.

3. Where work is performed in existing spaces or buildings and abandoned wiring or conductors are encountered, they shall be removed in accordance with the requirements of the National Electric Code.

C. Permits and Inspections

1. The Electrical Contractor shall obtain and pay for all permits required by the State of Michigan Labor Department, Electrical Division.

2. The Electrical Contractor shall submit, to precede request for final payment, a copy of the Certificate of Electrical Inspection as required by the State of Michigan.

1.5 GUARANTEE

A. Refer to Division 01 - General Requirements.

B. Refer to individual Division 26 sections for any additional guarantee requirements.

PART 2 - PRODUCTS

2.1 GENERAL

A. Refer to individual Division 26 sections for product specifications.

B. Material to be Returned to the Owner

1. Refer to Division 01 - General Requirements.

PART 3 - EXECUTION

3.1 GENERAL

A. Refer to Division 01 - General Requirements for items such as examination of premises, coordination with other trades, cutting and patching, connection to present equipment, etc.

B. Laying Out Work

1. All exterior light locations shall be staked out by the Contractor and approved by the Engineer prior to installation.

2. A/E or consulting firm shall generate “Point-by-Point” photometric calculations for submission and approval prior to finalizing pole & luminaire layouts; “pole height-to-spacing” ratio for all installations shall not be greater than 4:1

C. Equipment Supports

1. Enclosures for panelboards, motor starters, motor control centers, and other similar equipment shall be mounted on ½" spacers when mounted in a room on a below grade exterior wall.

D. Feeders and/or branch circuit wiring shall not pass through electrical equipment such as switchboards, panelboards, disconnect switches, and motor starter enclosures where the power source for that wiring originates in another location.

END OF SECTION 260500

1.0 GENERAL DESCRIPTION

1.1 The unit shall be a vandal-resistant communications device that is a multi-functional, freestanding pedestal constructed of carbon steel, model CB 1-s from Code Blue Corporation, no substitutions. It shall include a high quality, hands-free communications device illuminated by a high intensity faceplate light, a powerful combination blue beacon/strobe light and an area light that serve to easily identify it from a distance.

2.0 CONSTRUCTION

2.1 The unit shall be a cylinder constructed of ASTM A500 seamless carbon steel structural tube, 12.75” outside diameter x 0.135” thick wall, at a height of 108” and weigh approximately 210 lbs.

2.2 The unit shall have an internal anchor base plate that is MIG welded 2” above the base and fabricated with a minimum of 0.50” thick A-36 grade steel plate. It shall have a 5” diameter center hole for electrical conduit access. The base plate shall have four oblong holes on an 8” circular bolt pattern for attachment.

2.3 One access door measuring 14.00” H x 9.54” W will be placed 13.00” from the bottom of the base to provide access for mounting to the anchor bolts and connectivity to electrical facilities. The opening shall have a cover plate, which mounts flush and is the same steel and radius as the unit. The cover plate shall fit into the opening and have a weather-resistant gasket. The cover plate shall be held in place by two ¼-20 x 1” countersunk proprietary fasteners.

2.4 Tamper resistant proprietary fasteners manufactured for Code Blue Corporation shall be used. It shall not be possible to acquire the custom-designed bit from any other source.

2.5 Three area light openings 10” high and 10.72” wide, with the bottom of the openings approximately 14” from the top.

2.5.1 A heavy cylindrical lens made of clear UV-rated polycarbonate shall be mechanically and chemically fastened to the interior. The lens shall be fully sealed and treated to prevent damage from ultra-violet radiation, aging, cracking, yellowing or breaking.

2.6 A recessed opening shall be cut at a point beginning 36.6” above the bottom of the unit. The opening shall be 15.1” tall at the forward edge and 12.8” tall at the rear edge, creating a 25-degree angle from the horizontal and an arc of 160 degrees in the face.

2.6.1 The opening shall be enclosed by a 7 gauge steel plate with a single opening for a communication device.

3.0 MOUNTING

3.1 The unit shall be mounted onto four anchor bolts that are set 0.50” above the concrete. Standard 0.75” x 24” galvanized steel anchor bolts, nuts and washers shall be supplied.

3.2 The concrete foundation shall measure 24” x 24” minimum and the anchor bolts shall protrude 6” from the foundation.

3.3 Unit shall include a weather-resistant, vented rubberized gasket mounted into the base to prevent entry of sediment and pests.

4.0 ELECTRICAL

4.1 All electrical components shall have a modular plug for easy service and replacement, and will be equipped with a fuse for protection from transient voltage conditions.

4.2 Requires 2.5 ampere at 24V AC.

4.3 Voltage options shall include: 12-24V AC/DC; 120, 240 and 277V AC.

4.4 The unit shall have the option for Power over Ethernet for connectivity to a VoIP network switch with 802.3af or 802.3at (minimum) capabilities. Requires the LS1000 or IP5000 phone for connectivity to ToolVox or SIP/IAX2 compatible VoIP system.

5.0 LIGHTS

5.1 LED Beacon/Strobe: Located in the dome top assembly with a rating of no less than 270 Lumens/92 candela, it shall have a factory-set flash rate of up to 375 flashes per minute and be programmable. A deep blue UV-rated polycarbonate prismatic refractor shall surround the LED Beacon/Strobe and be used to distribute the light in a horizontal pattern for maximum brightness and visibility.

5.1.1 The communication device shall be factory programmed to activate the LED Beacon/Strobe for the duration of a call.

5.1.2 The LED Beacon/Strobe shall be 5.10” tall and 5.50” in diameter.

5.2 Area Light: The LED Area Light shall be protected within the two light openings by a .13” thick UV-rated polycarbonate lens and be used to distribute light in a horizontal and vertical pattern.

5.2.1 A reflector disk shall be mounted above to direct light outward and downward.

5.2.2 It shall measure 10.72” W x 10” H, with the opening 14” from the top.

5.2.3 It shall have a Lumen rating of 852.

5.3 Faceplate light: LED will direct light onto the communications device and be vandal resistant.

5.3.1 The opening shall measure 4.50” W x .50” H.

5.3.2 The light shall have a lifetime of 100,000 hours and a rating of 100 Lumens.

6.0 COMMUNICATIONS

6.1 The unit shall have a speakerphone communication device.

6.1.1 LS1000/LS2000 – VoIP: Refer to the ***LS1000 and LS2000 Architect and Engineering Specification*** for further information.

6.1.2 IP5000 - VoIP: Refer to the ***IP5000 Architect and Engineering Specification*** for further information.

6.1.3 IA4100 - Analog: Refer to the ***IA4100 Architect and Engineering Specification*** for further information.

6.2 The unit shall be capable of communicating via third party IP wireless and cellular devices, which can be housed within the unit.

6.3 EIA/TIA, ANSI, CSA and BICSI cabling or similar standards shall be adhered to for proper operation of devices connected to copper or fiber infrastructure.

7.0 FINISH

7.1 Four-coat paint process, with zinc-rich primer for corrosion resistance and baked-on polyurethane enamel for maximum gloss and shine.

7.1.1 Optional clear coating process available to provide additional environmental protection.

7.2 Substrate preparation shall be as required to comply with applicable ASTM impact and adhesion standards: D2794 Direct and Reverse Impact, D523 Gloss @ 60 Degrees, D3359B Cross hatch Adhesion, D1654 Corrosion Creep, D714 Scribe Blisters and D714 Field Blisters.

7.3 The finish shall be available in 7 standard colors: Safety Blue, Safety Red, Safety Yellow, Gloss White, Gloss Black, Dark Bronze and Bright Silver. Custom colors shall be available.

7.4 Minimum coverage thickness of 2.0 mils.

8.0 COMPLIANCE

8.1 Americans with Disabilities Act (ADA) compliant

8.2 UL 62368-1

8.3 CSA C22.2 No. 62368-1

8.4 NFPA 72 Chapter 24 (2010) compliant

8.5 Meets NEMA 3 requirements

9.0 GRAPHICS

9.1 Engineering grade reflective vinyl for high visibility and legibility.

9.2 Standard 3.25” tall and 30” long graphics text offerings: Emergency, Assistance, Security, Courtesy, Police, Information or Help Point.

9.3 Standard graphics color offerings: Reflective White, Reflective Blue, Reflective Black, Reflective Green, Reflective Red and Reflective Yellow.

9.4 Custom text, length and color options shall be available.

10.0 OPTIONS

- Active Vent Solar Powered Fan for improved air flow
- Overhead Camera Mount
- 360° Public Address Speakers
- Second faceplate opening for directory listings, camera, card reader or other mounted devices.
- Temperature-controlled compartment capable of housing an AED device
  - Stainless steel housing shall be factory installed with dimensions of 12” W x 21.42” H x 8.62” D
  - The communication device shall be factory programmed to activate the AED door remotely
- NightCharge® power system
- Mounting Rings for housing and mounting third party security and communication products
- Secondary Access Door

11.0 WARRANTY

11.1 The CB 1-s shall be warrantied against any defects in material and workmanship, under normal use, for a period of 2 years from date of installation. If system is found by manufacturer to be defective within the warranty period, manufacturer shall repair and/or replace any defective parts, provided the equipment is returned to manufacturer.

12.0 MANUFACTURER

12.1 The Manufacturer shall be Code Blue Corporation. 800-205-7186, 259 Hedcor Street, Holland, Michigan 49423. www.codeblue.com. THERE ARE NO EQUIVALENTS.

CB1 Series

Models: ENTM02, ENTM03, ENTM04, ENTM05

Admin Guide

Installation | Configuration | Support | Maintenance | Use

Code Blue®
800.205.7186 • www.codeblue.com

WARNING

ONLY QUALIFIED PERSONNEL SHOULD INSTALL THESE UNITS. THE INSTALLATION SHOULD CONFORM TO ALL LOCAL CODES. IN SOME COUNTRIES, A CERTIFIED ELECTRICIAN MAY BE REQUIRED.

NOTICE TO USERS

Table of Contents

Table of Contents (continued)

2 Introduction

Thank you for choosing the **CB 1 Series** for your Code Blue application.

The **CB 1 Series** of products are the original Code Blue pedestal units that set the industry standard for rugged construction, full feature availability and high visibility. The **CB 1 Series** is easily recognized throughout a full 360-degree area. The user friendly lighted faceplate and the integral area light ensure rapid location in an open environment. The high output strobe is easily identifiable by security when activated.

The **CB 1 Series** is an excellent choice for walkways, parks, college and commercial campus areas, open landscape areas and anywhere a freestanding pedestal unit is required.

The exclusive analog InterAct and VoIP speakerphones are designed for maximum reliability, vandal resistance, auxiliary functions, mass notification control, and fault monitoring and reporting capability. (See IA4100 or LS1000 guides for more information.)

Our unmistakable craftsmanship makes our Help Points® the most rugged on the market, withstanding the punishment of natural and man-made disasters. With durable construction, our pedestal units can meet any requirement or purpose. **CB 1 Series** units have a rugged steel construction, shatterproof Lexan Lens, industrial engineering grade reflective graphics and weather, UV and graffiti resistant paint. They are illuminated by a high-powered, 270 lumens/92 candela LED blue beacon/strobe.

Other options include:

- IP and analog phones
- Low power consumption LED faceplate light
- Long-life LED area light
- NightCharge® & PoE power options
- 360° Audio Paging Speaker
- Custom colors and graphics
- Second Opening for camera, card reader, directory, & other customizable options
- Overhead Camera Mounts
- Mounting Rings

This guide contains a general overview of the CB 1 Series options, including the CB 1-e & CB 1-s models, their application, installation and wiring.

CB 1-e

CB 1-e with Dual Faceplate

CB 1-e with AED Housing

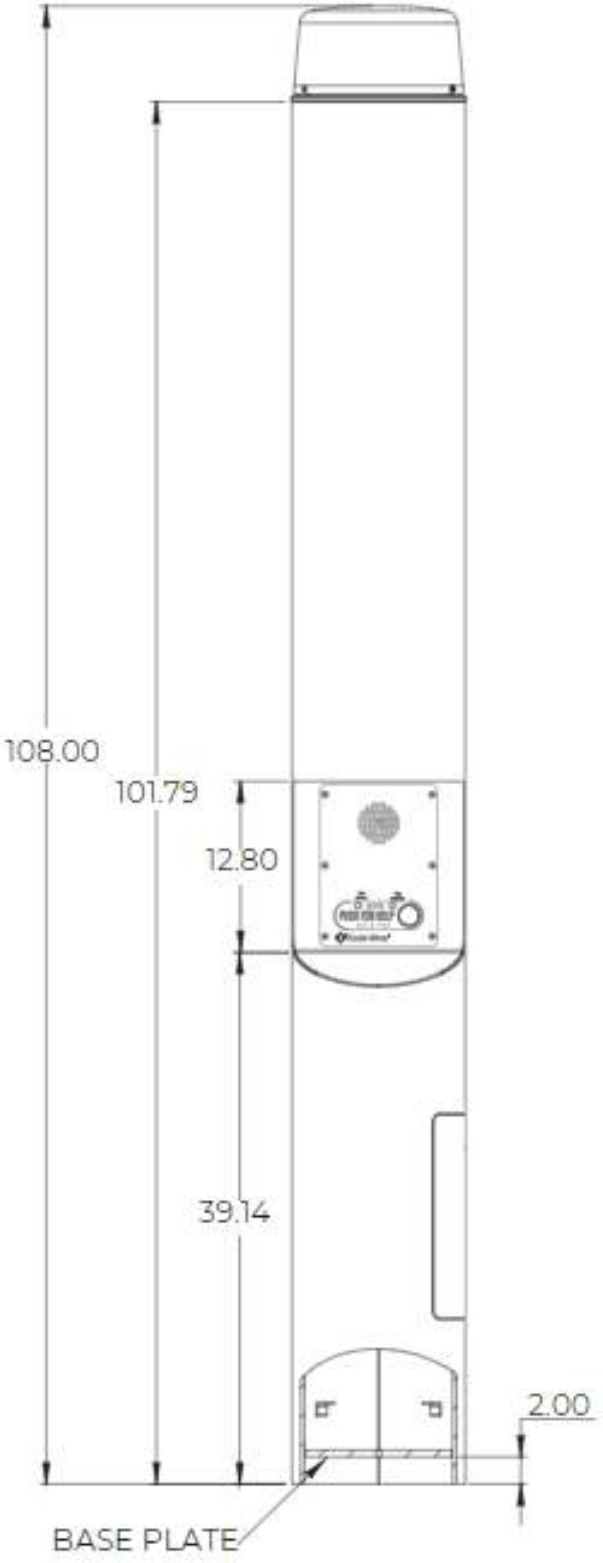
CB 1-s

CB 1-s with Dual Faceplate

CB 1-s with AED Housing

3 Dimensions

CB 1-e



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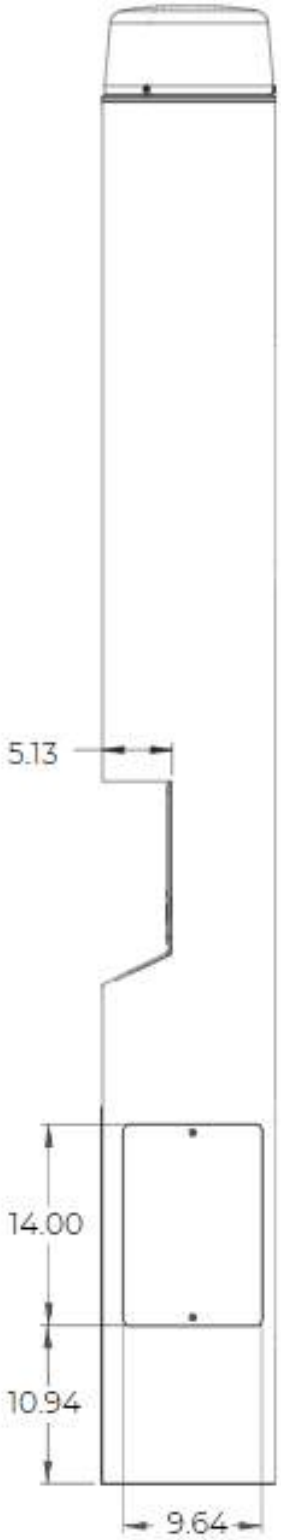

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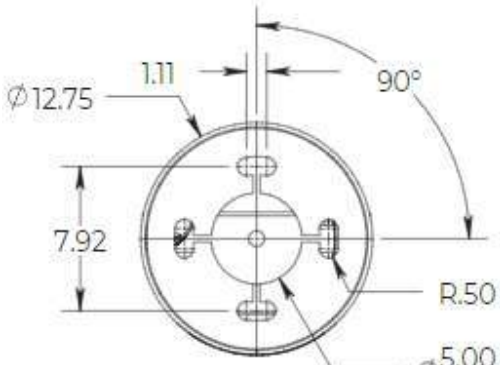
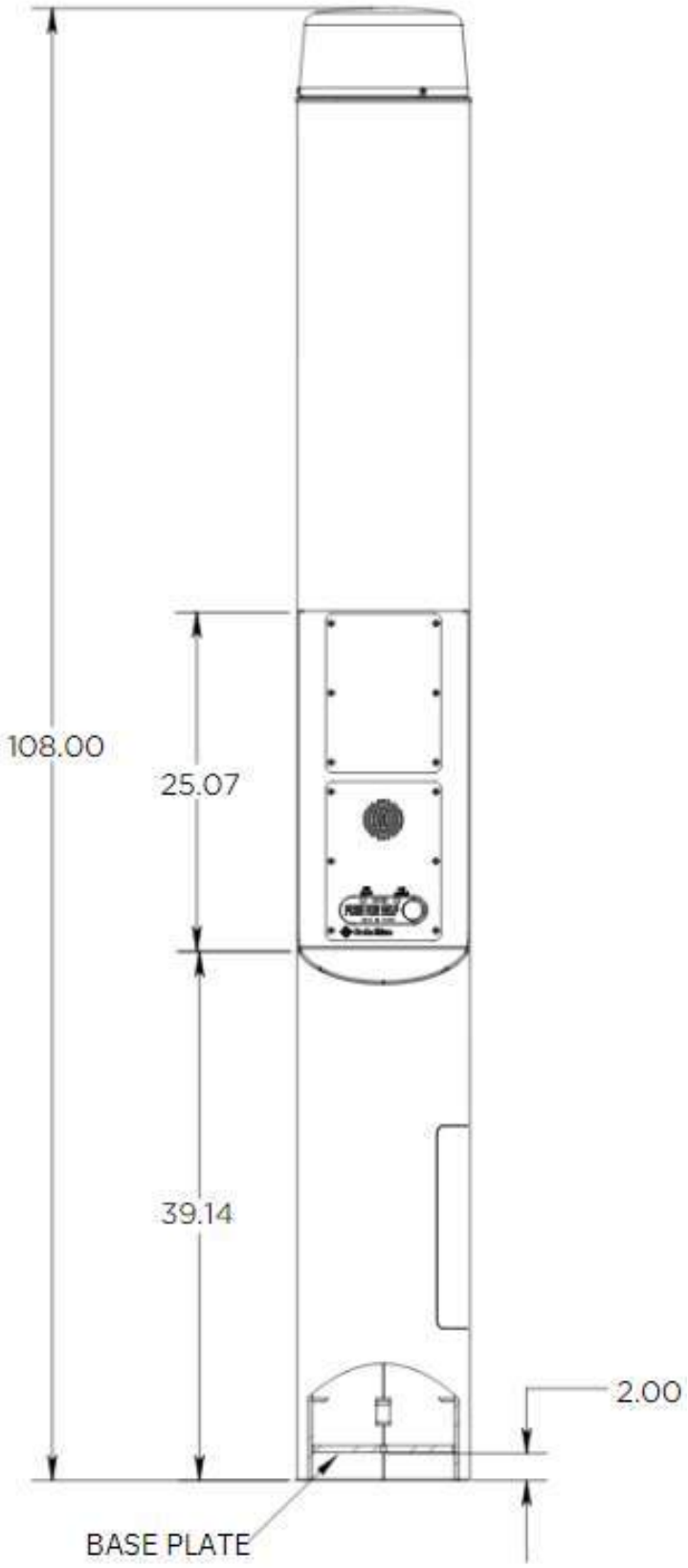
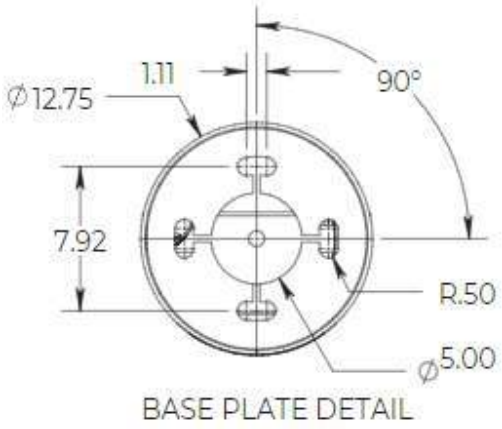


BASE PLATE DETAIL

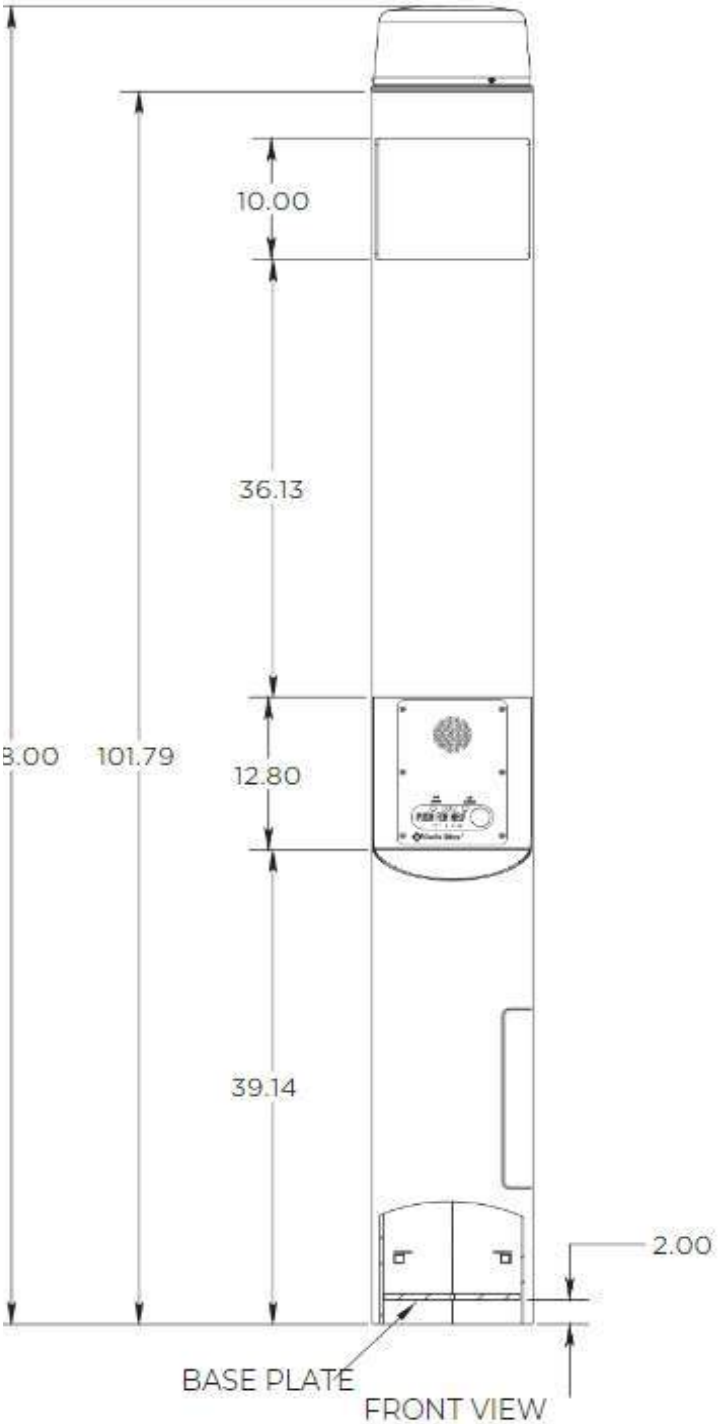
CB 1-e with Dual Opening





BASE PLATE DETAIL

CB 1-s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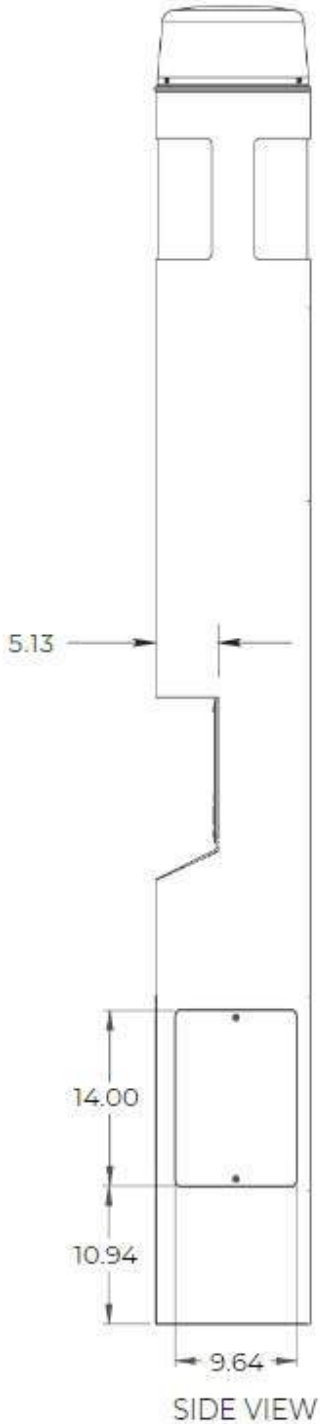
BASE PLATE
FRONT VIEW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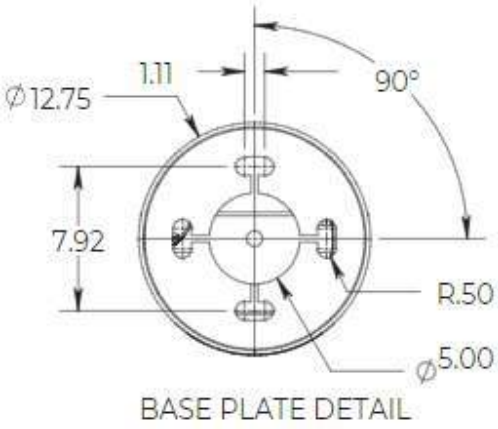
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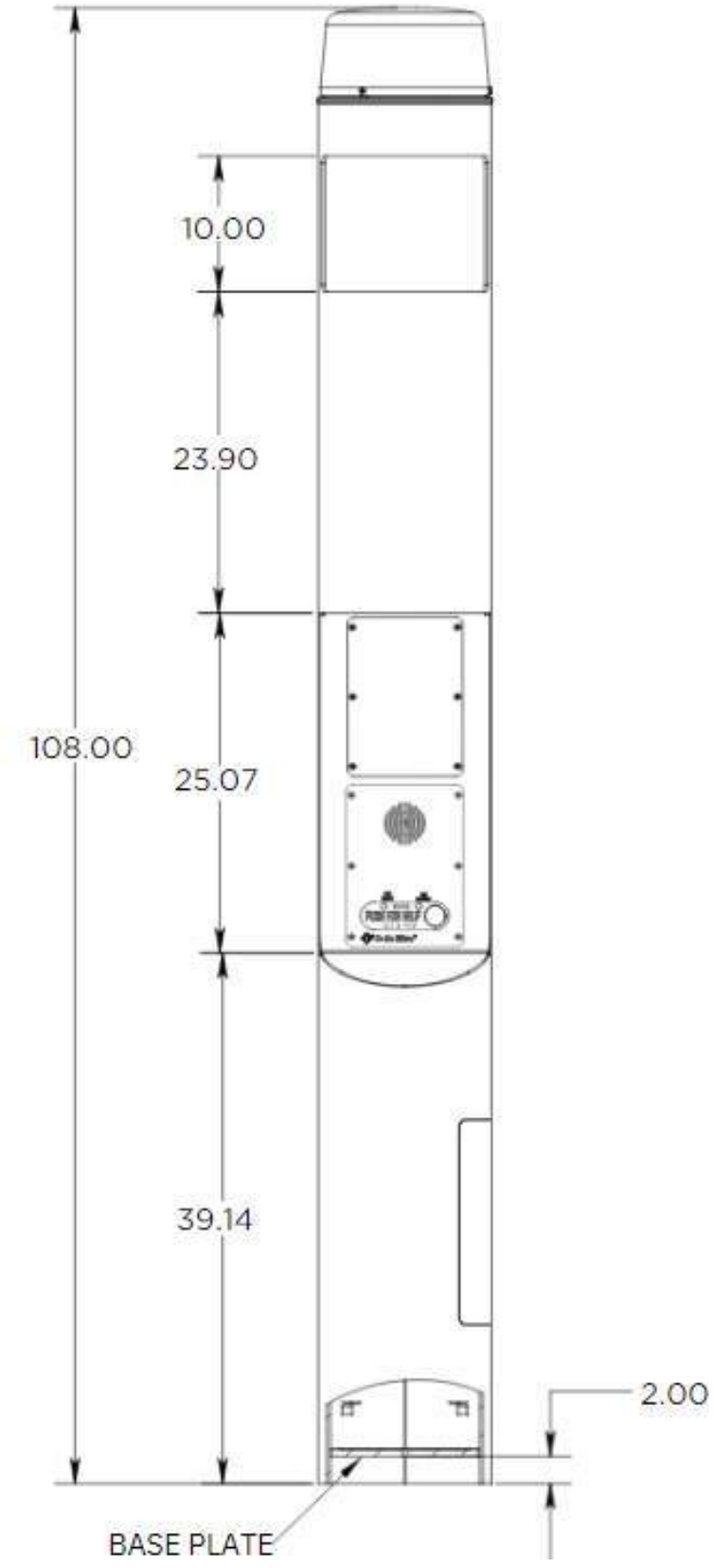
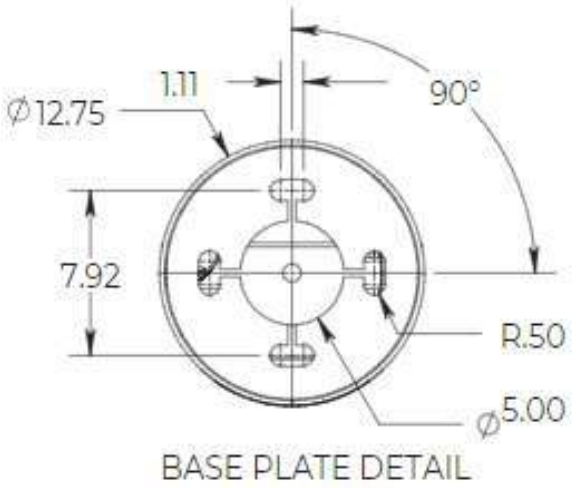
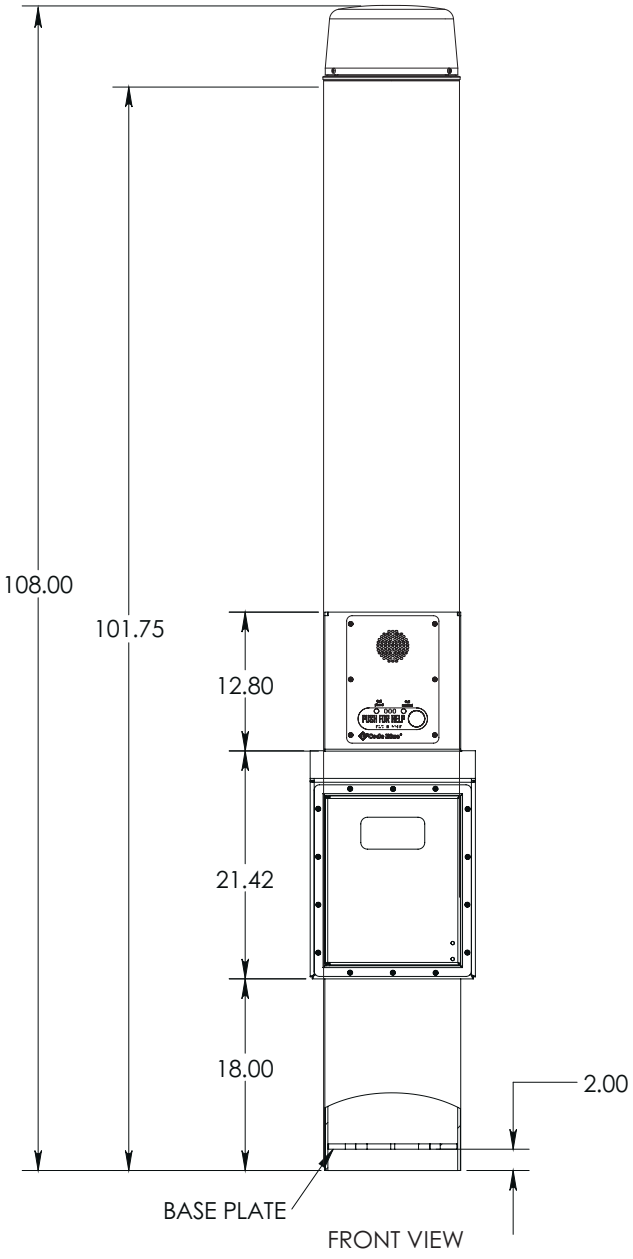
BASE PLATE DETAIL

CB 1-s with Dual Opening





CB 1-e with AED Housing



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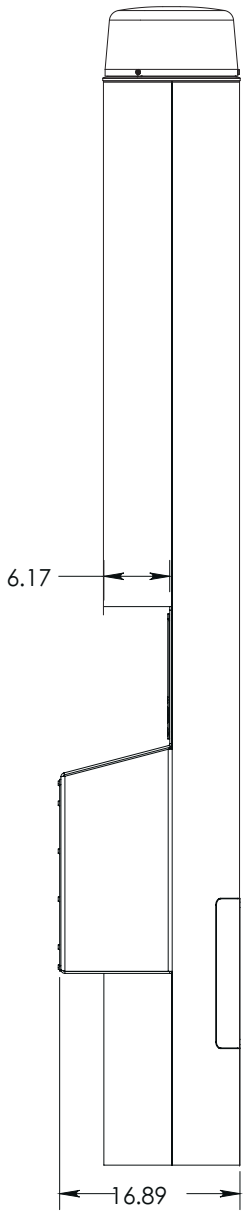

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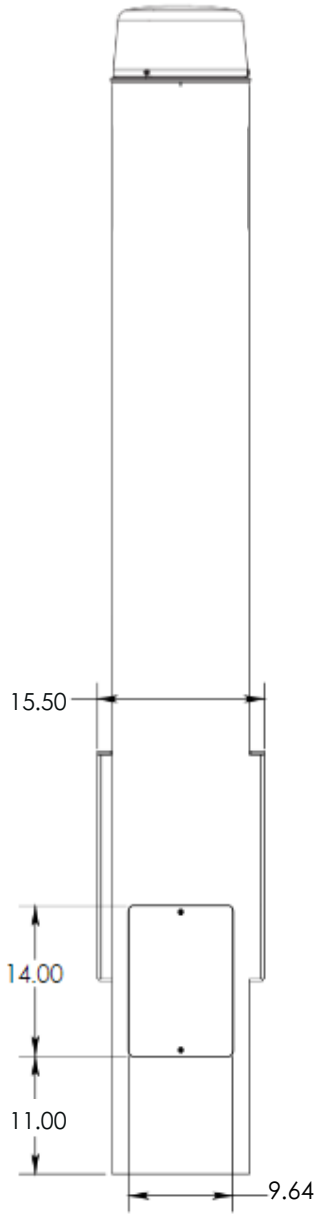

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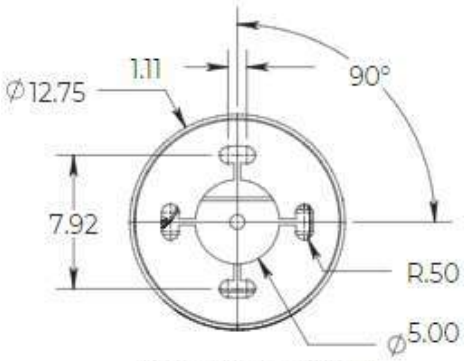
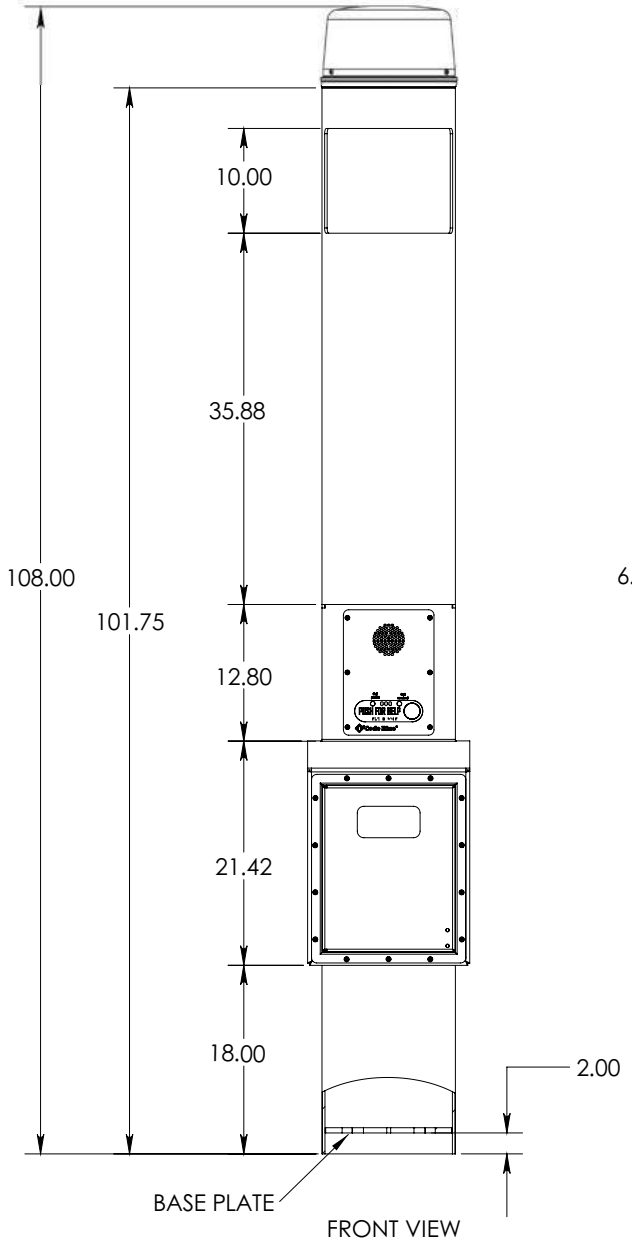


BASE PLATE DETAIL

CB 1-s with AED Housing



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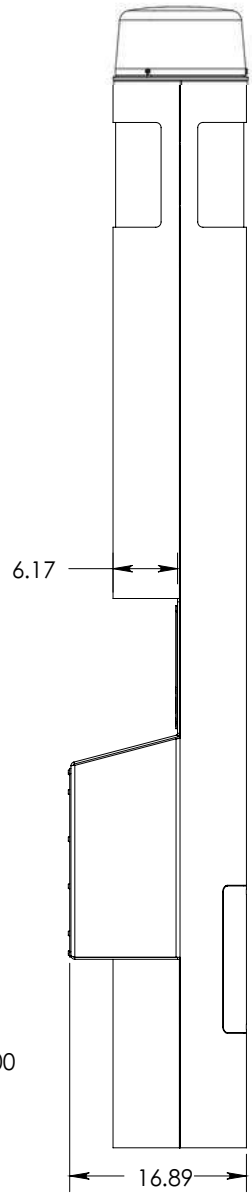

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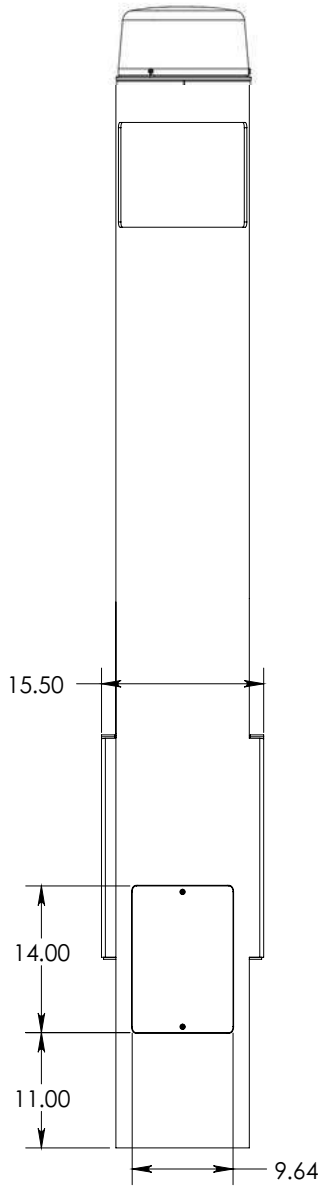
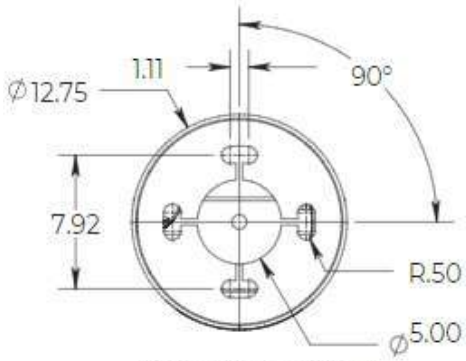


BACK VIEW



BASE PLATE DETAIL

4 Safety Information

HAZARD LEVELS LEGEND

DANGER	Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.
CAUTION ⚠	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a situation which, if not avoided, could result in damage to property.
IMPORTANT	Indicates significant information that is essential for proper product functionality.
NOTE	Indicates useful information that helps get the most out of a product.

Safety Instructions

WARNING
- Code Blue products shall be installed by trained professionals. The installation should conform to all local codes. In some countries, a certified electrician may be required.

NOTICE
- When transporting a Code Blue product, use the original packaging or equivalent to prevent damage to the product.
- Code Blue products shall be used in compliance with local laws and regulations.
- Store the Code Blue product in a dry and ventilated environment.
- Do not install the product on unstable brackets, surfaces or walls.
- Use only applicable tools when installing Code Blue products.
- Do not use chemicals, caustic agents, steel wool or aerosol cleaners other than those tested and recommended by Code Blue.
- Use only accessories that comply with technical specifications of the product. These can be provided by Code Blue or a third party.
- Use only spare/replacement parts provided by or recommended by Code Blue.

Transportation

NOTICE
- When transporting a Code Blue product, use the original packaging or equivalent to prevent damage to the product.

5 Installation Instructions

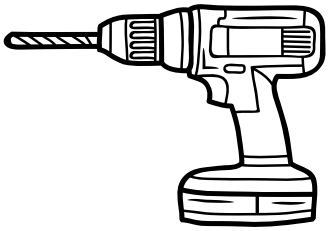
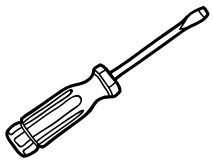
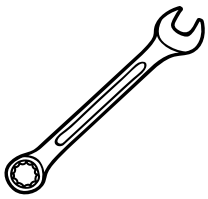
Tools Needed

All CB1 Units Require:

• Ladder to reach the top of the unit.
• Drill & Security Bit for removing & inserting security screws on phone, dome top, & access door.
• 1-1/8” Socket set & extension
• Phillips and flat head screwdrivers

CB1 Units w/ NightCharge® Require:

• ½” wrench for NightCharge® batteries.

Getting Started

Important Notes:

- EIA/TIA, ANSI, CSA and BICSI cabling or similar standards shall be adhered to for proper operation of Code Blue communication devices connected to copper or fiber infrastructures communications cable and electrical cable in the same conduit is not an acceptable installation and shall not be supported. Analog phones require a minimum of 23mA for proper operation (26-29mA recommended).

- Each analog speakerphone requires its own phone line or PBX extension. Multiple units shall not be supported.

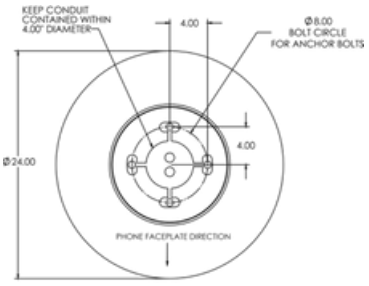
- Speakerphones require programming before operation. Consult the speakerphone's Administrator Guide for instructions.

- If you are installing IP speakerphones, please read the appropriate manuals and consult with your Network Administrator.

- Size electrical wiring based on length of run.

Anchor Bolt Kit Instructions

1. FOUNDATION

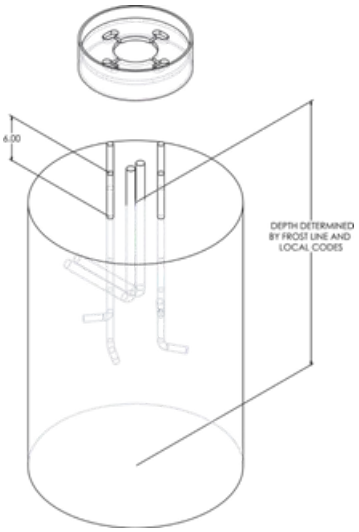


USE PROVIDED TEMPLATE TO LOCATE ANCHOR BOLTS

1.1 Run Conduit

Electrical and telephone line conduit, with a maximum combined diameter of four inches, should be run up through the center of the foundation hole. A minimum of four inches and a maximum of six inches of conduit above the finished grade level is required. To ensure proper grounding, a ½-inch x 8-foot copper rod should be inserted in the center of the foundation and tied to the steel pedestal.

NOTE: Follow all national and local codes governing this installation.



1.2 Pour the Foundation

The foundation should be at least 24 inches in diameter and to the correct depth for the frost line in your area, with a mini- mum depth of at least three feet (follow local building codes for foundations).

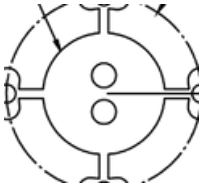
1.3 Set the Anchor Bolts in the Wet Foundation

Four 24-inch L-shaped anchor bolts and an aligning template are supplied for anchoring the Code Blue unit. The bolts should be set into the foundation so that six inches are left showing above the finished grade level. The anchor bolts should be aligned, using the supplied template in such a way that the phone faceplate on the unit face in the desired direction.

2. PULL WIRING

IMPORTANT:

- *Wire gauge must be selected to meet code for voltage/current required for the product to operate correctly: Minimum 14 AWG.*
- *Conduit used must comply to National Electrical Standards as observed locally.*



2.1 Pull Power and Phone Line up through Conduits

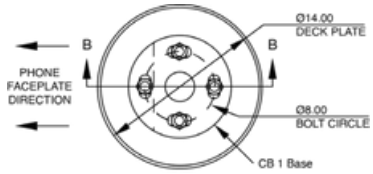
A minimum of two feet of wire must be available from the con- duit for electrical and communications wiring.

NOTE: Communications wire must be shielded phone line. The phone line must be pulled into the unit using a separate conduit from the power. Along with a service loop of wire, as noted by the NEC standards.

Deck Mount Kit Instructions

SKIP if installation does not include a Deck Mount Kit

1. DECK FOUNDATION

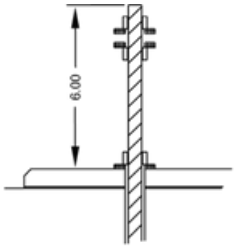


1.1 Drill Deck Holes

Drill four holes through the deck or floor for the four 3/4" threaded rods. The holes should be aligned, using the tem- plate provided in such a way that the phone faceplate on the unit will face in the desired direction.

1.2 Drill Conduit Hole

Drill a fifth hole in the center to accommodate the conduit.



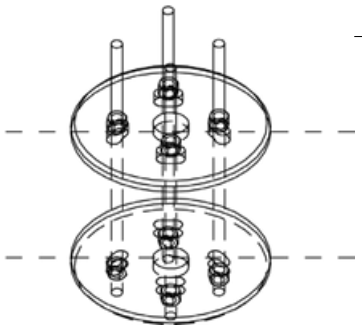
1.3 Position Upper Deck Plate

Position the first plate working from above the deck.

1.3.1 Thread a nut and washer on the end of each rod so that approximately six inches extends beyond the base of the washer.

1.3.2 Insert each rod through the top side of the plate, plate gasket, and down through the four holes in the deck.

NOTE: The top of the plate is the side with the tapered edge.



1.4 Position Lower Deck Plate

Position the second plate working from below the deck. Have another worker hold the upper plate and rods in place from above the deck.

1.4.1 Place the second plate gasket and then the second plate over the threaded rods.

1.4.2 Secure the second plate with nuts and washers pro-

vided. If required, readjust the nuts so that six inches of the rods are above the top of the upper plate.

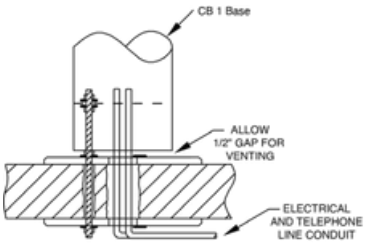
1.5 Secure Lower Nuts

To prevent tampering, it is advisable to tack weld the lower nuts to the threaded rod.

2. PULL WIRING

IMPORTANT:

Wire gauge must be selected to meet code for voltage/current required for the product to operate correctly: Minimum 14 AWG. Conduit used must comply to National Electrical Standards as ob- served locally.



2.1 Pull Power and Phone Line up through Conduits

A minimum of two feet of wire must be available from the conduit for electrical and communications wiring.

2.2 Conduit

Electrical and telephone line conduit is run through the deck and the center openings (two-inch diameter) of the upper and lower deck plates. A minimum of four inches and a maximum of six inches of conduit above the upper plate is required.

NOTE: Communications wire must be shielded phone line. The phone line must be pulled into the unit using a separate conduit from the power. Along with a service loop of wire, as noted by the NEC standards.

Base Gasket Instructions

1. SET THE NUTS AND WASHERS

IMPORTANT: Leveling the bottom nuts is crucial to leveling the unit.
A small error will be magnified after installation.

Screw one set of nuts and washers onto the anchor bolts:

After the foundation has set, screw one set of nuts, followed by one set of washers, onto the anchor bolts. Set the nuts so the lowest washer is about 2½ inches above the concrete at an even height.

To accomplish this, use a small level and check from front to back, side to side, & diagonally. These nuts are NOT adjustable after the unit is in place.

The bottom edge of the Code Blue unit will be 1/2" above the concrete when in stalled.

2. SET UNIT UPRIGHT ON ANCHOR BOLTS

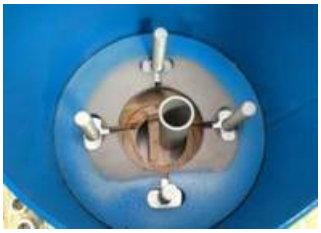
IMPORTANT: A ½-inch minimum air gap is required between the foundation and the unit to prevent moisture problems.

Set the Code Blue unit on the anchor bolts:

Align the phone plate in the desired direction and lift the Code Blue unit over the anchor bolts. The unit may be lifted using the bracket on the inside of the unit.

Note that the unit weighs approximately 200-400 pounds. Use appropriate lifting materials and methods to avoid possible injury and/or damage.

3. SECURE THE UNIT



Use Access Door to reach mounting studs

Access the mounting studs through the door on the side of the unit.

Place the base gasket

Set the gasket on the bolts and cut a small hole where the conduit is located.

Stretch the screen tightly around the conduit pipe. Slide the gasket over the bolts to the base of the unit.

*For an extra-strong seal, a bead of silicone caulk can be put on the gasket from bolt hole to bolt hole before setting the gasket into place and around the conduit.

Fasten

Place the second washer on the anchor bolt and place the nut on top.

Tighten the mounting nuts onto the anchor bolts. This may be more convenient if a long socket (extension and universal joint) is used to tighten the hardware.

360° Audio Paging Top Installation

SKIP if installation does not include an Audio Paging Top.

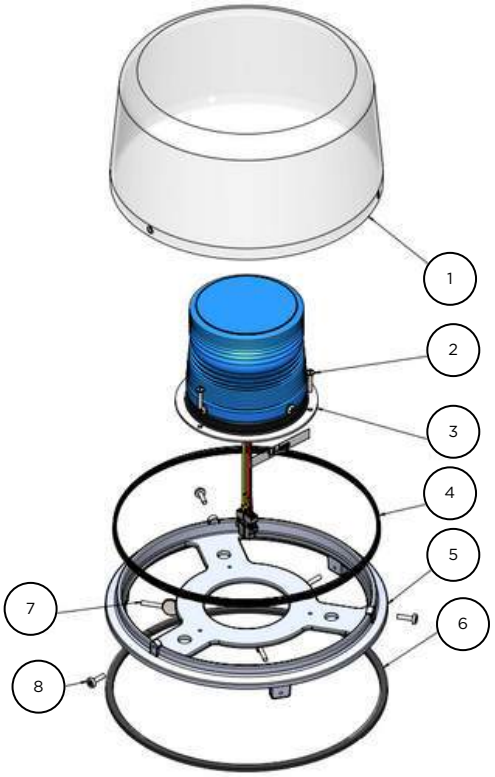
- **The following models are covered in the installation instructions for CB 1 Series with Audio Paging or the Current 360° Audio Paging Retrofit Kit:**
  - CB 1-e
  - CB 1-s

- **Tools Required**
  - Ladder – to reach the top of the unit.
  - Security bit – to secure the Audio Paging top to the adapter ring.
  - 6mm Allen wrench – to secure the Audio Paging adapter ring to the top of the unit.

Before You Begin: Remove power from the unit.

- **Existing Dome Top Removal** (See Figure 1 below for referenced components)
  - Remove the 3 security screws securing the dome top lens to the dome top casting.
  - Locate and remove the 3 thumb screws securing the dome top casting to the tower unit.
  - Raise the dome top assembly upwards & disconnect the red/black and yellow/yellow wiring harnesses connected to the beacon/strobe mounted in the dome top assembly.

Dome Top Assembly Components



#	Component	Qty
1	Dome Top Lens	1
2	Strobe Assembly Mounting Screws	3
3	Beacon Strobe Assembly	1
4	Dome Top Tech Brush	1
5	Dome Top Casting	1
6	Dome Top Assembly Gasket	1
7	Thumb Screws	3
8	Security Screws	3

Figure 1

(Continued on next page)

- **Install 360° Audio Paging Top** (See Figure 2 below for component references).
  - Insert the Audio Paging Top Housing into the CB 1 Tower.
  - Ensure the paging top is aligned properly and level. Reach through the housing, tighten the 3 set screws into the side wall of the tower using the required Allen wrench.
  - Connect all amp and lighting wiring harnesses as detailed in the Wiring Diagrams section of this guide.
  - After all wiring is properly and securely connected, place the beacon strobe assembly on top of the audio paging housing, making sure to properly align the dome top casting with the coordinating notches in the paging housing. Once in place, secure the beacon strobe assembly to the paging housing using the 3 thumb screws provided.
  - Place the dome top lens over the beacon strobe assembly, aligning the holes with the threaded screw holes located on the dome top casting.
  - Secure the dome top lens into place, using the 3 provided security screws.
  - Reapply power to the unit.

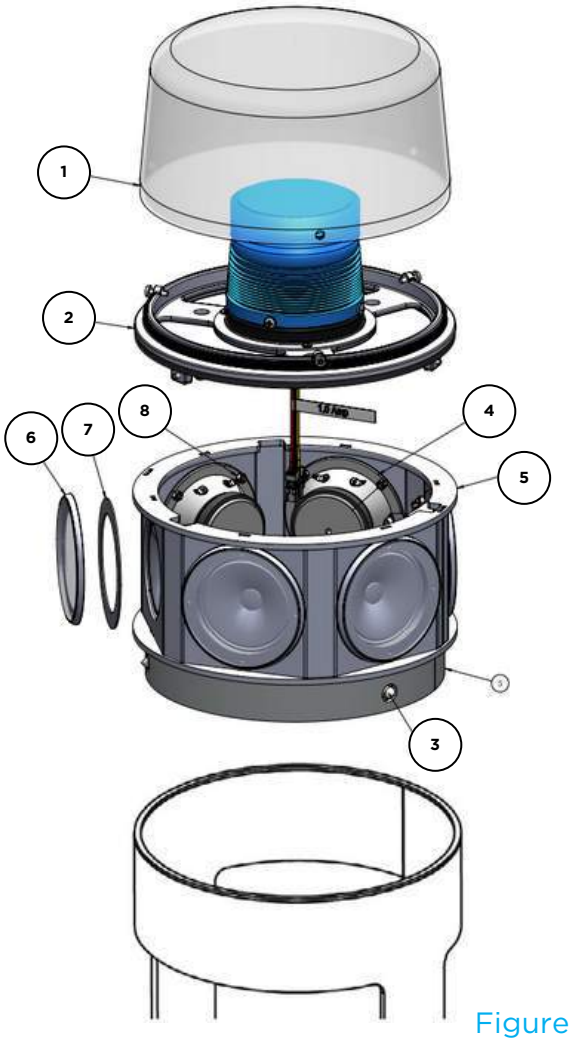


Figure 2

#	Component	Qty
1	Dome Top Lens	1
2	Beacon Strobe Assembly	1
3	Set Screws	3
4	Speaker	6
5	Audio Paging Top Speaker Housing	1
6	Speaker Grille	6
7	Nylock Nut	24
8	Speaker Gasket	6

Important Update: 360° Audio Paging Speaker Array for CB1 Towers

In August 2023, due to changes in the global supply chain market impacting component availability, Code Blue discontinued it's use of the 360° Audio Paging Speaker Array that had been in place since 2017 and installed on CB1 & CB5 tower units. This change comes with not only cosmetic differences, but technical specifications as well. For additional questions regarding this new speaker array configuration, please contact Code Blue Technical Support at technicalsupport@codeblue.com or call 800-205-7186, Opt. 3.

Current 360° Audio Paging System for CB1 & CB5 Series - Produced after August, 2023.

Legacy 360° Audio Paging System for CB1 & CB5 Series - Produced prior to August 2023.

	Current 360° Audio Paging System	Legacy 360° Audio Paging System
Required Incoming Voltage	12V DC @ 4 Amp	120V AC @ 4 Amp
Speaker Array Material	Carbon Steel	ABS Plastic
Impedance	8 Ohms	5.3 Ohms
Frequency Range	450 Hz - 8000 Hz	450 Hz - 7000 Hz

For full product specifications, see A&E Specifications Sheet #AE-0126.

Overhead Camera Mount Accessory

SKIP if installation does not include an Overhead Camera Mount accessory.

TOOLS REQUIRED

1.0 RETRO-FITTING EXISTING UNIT

1.1 If applicable, remove dome top assembly prior to installation.

New style dome top assembly is required to access installation screws on Overhead Camera Mount.

2.0 INSTALL CAMERA MOUNT

2.1 Locate and install the three ½ x 1-inch hex Allen screws from the inside of the mounting ring. Be sure the Allen screws do not extend beyond the outside of the ring.

2.2 Install the camera mount on top of the unit. Rotate to desired position.

NOTE: *If retrofitting existing unit with three countersunk holes near the top of the bollard, the Overhead Camera Mount may be rotated to align the clearance holes with holes in the unit. The three counter- sunk screws and nuts provided may be used to cover these holes.*

The three Allen screws MUST be used to secure the Overhead Camera Mount to the unit.

2.3 Verify camera mount is evenly positioned to ensure gasket seal is seated appropriately 360 degrees.

2.4 Apply downward pressure while simultaneously tightening the three 1/2" set screws until snug against the inside of the pedestal.

3.0 INSTALL CAMERA

3.1 Camera and wiring is installed into the male 1 ½ NPT.

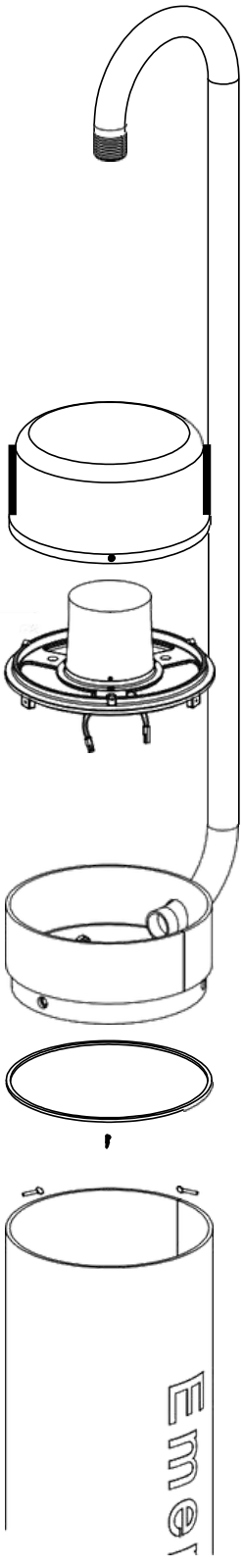
4.0 INSTALL THE DOME TOP ASSEMBLY

4.1 Remove the clear Lexan dome from the black metal casting.

4.2 The casting, complete with strobe, should be brought to the top of the unit (Overhead Camera Mount) where the wiring will be connected (see wiring instructions).

4.3 After the wiring is complete, set the casting on top of the unit and fasten the casting to the Overhead Camera Mount by reaching through the casting openings and tightening the three 10-24 X 1-inch stainless steel thumbscrews against the inner wall.

4.4 Finally, reattach the clear Lexan dome to the black metal casting with the security screws provided.



Equipment Ring Accessory

SKIP if installation does not include an Equipment Ring accessory.

Code Blue has blank Mounting Rings as optional features for its 1 Series Pedestal Help Points®. Designed in three varieties, these rings allow a customer to internally and externally mount third party communication and security equipment to their unit to enhance connectivity and functionality.

INSTALLATION FOR:

All Rings: CB 1-e and CB 1-s

5.25" Mounting Ring

5.25" Mounting Ring w/ Antenna Post

TOOLS REQUIRED:

- Allen wrenches
- Security bit
- Ladder(if retrofitting)
- Mounting Ring with screws

INSTRUCTIONS:

- If applicable, remove dome top assembly using security bit prior to installation. New style dome top assembly (part #40259) is required to access installation screws on Mounting Ring. Locate and install the three ½ x 1-inch hex Allen screws from the inside of the Mounting Ring using the Allen wrench. Be sure the Allen screws do not extend beyond the outside of the ring.

- Install the mounting ring on top of the unit. Rotate to desired position.
  - *NOTE: If retrofitting existing unit with three countersunk holes near the top of the unit, the Mounting Ring may be rotated to align the clearance holes with holes in the unit. The three countersunk screws and nuts provided may be used to cover these holes. The three Allen screws MUST be used to secure the mounting ring to the unit.*
  - *NOTE: If installed on a unit with an Overhead Camera Mount, the Mounting Ring should be mounted on top of the Overhead Camera Mount ring.*

- Verify Mounting Ring is evenly positioned to ensure gasket deal is seated appropriately 360 degrees.

- Apply downward pressure while simultaneously tightening the three 1/2" set screws until Mounting Ring is snug against the inside of the unit.

- Install Beacon/Strobe dome top assembly.

POWER:

- The 1 Series power configuration is only intended to support the electronics Code Blue installs as standard equipment.

***IF A CUSTOMER INSTALLS THEIR OWN POWER SOURCE, IT WILL VOID THE ENCLOSURE'S UL LISTING.**

Dome Top

1. REMOVE THE PACKAGING

Remove the clear Lexan dome from the black metal casting. The casting complete with strobe should be brought to the top of the unit (pedestal) where the wiring will be connected.

2. INSTALL THE LIGHT FIXTURE

Match black and red wire connectors (match yellow to yellow connectors).

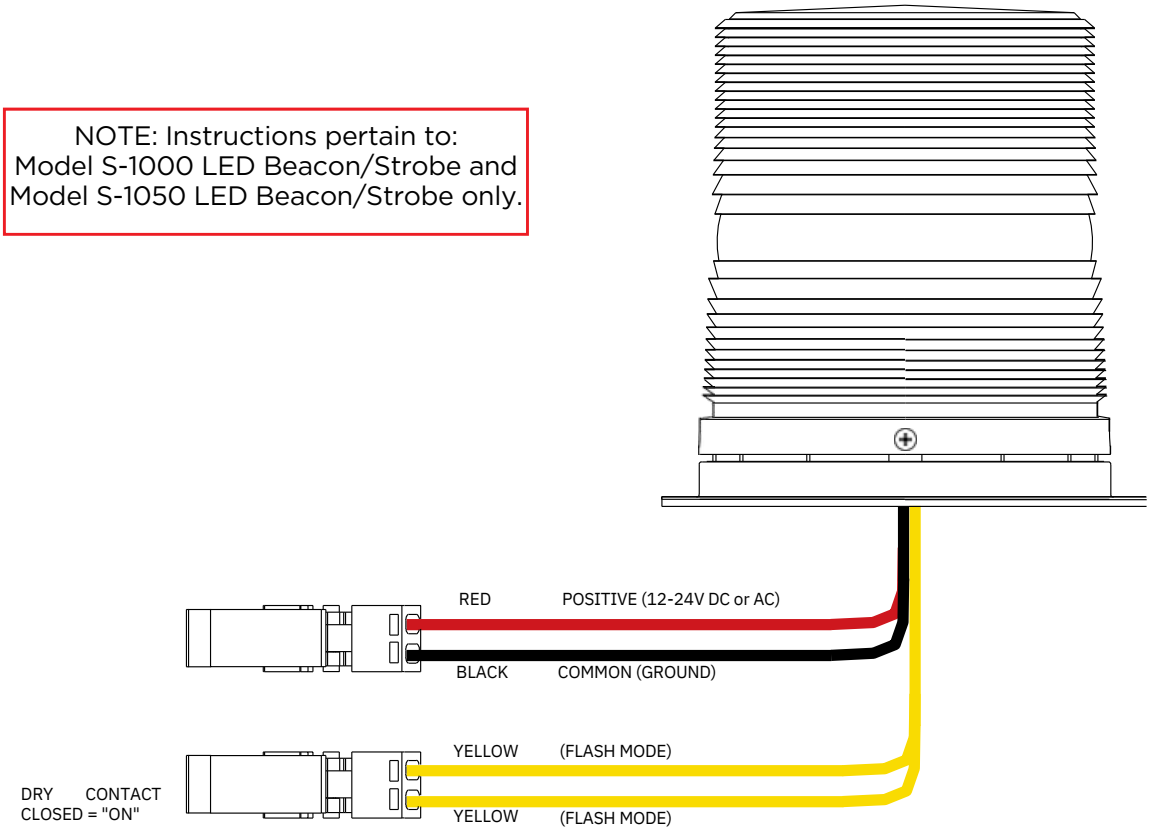
3. CONNECT THE CORD

After the wiring is complete, set the white disc on top of the lens located inside the unit (CB1-s only). Set the casting on top of the pedestal and fasten the casting to the bollard by reaching through the openings and tightening the three 10-24 x 1-inch stainless steel thumbscrews against the inner wall.

6 Beacon Strobe Operation & Programming

S-1000 & S-1050 Strobe Operation

NOTE: Instructions pertain to:
Model S-1000 LED Beacon/Strobe and
Model S-1050 LED Beacon/Strobe only.



CAUTION ⚠ **REMOVE ALL POWER FROM UNIT BEFORE SERVICING.**

OPERATION

To activate the LEDs in the PRIMARY-STEADYBURN MODE, connect the BLACK and RED wires to 12-24 volts AC or DC.

When in PRIMARY-STEADYBURN MODE, to change the LEDs to SECONDARY-FLASH MODE, connect both YELLOW control wires together (i.e., CLOSED = ON).

PHOTOCELL FEATURE (S-1050 MODEL)

The Steadyburn Mode will be ON in dark or night ambient environments and OFF in bright or daylight ambient environments. The S-1050 LED Beacon/Strobe has two built-in photo response features: (a) dawn/dusk transition delay of 15-30 minutes and (b) transient light acknowledgement delay of at least 3 minutes.

PROGRAMMING PRIMARY & SECONDARY MODES

1. Remove power from unit.

2. Short the Yellow wires together.

3. Restore power to the unit and wait until the unit begins to flash. Once the unit begins to flash, remove the short. The unit will alternately demonstrate the Secondary-Flash Mode and Primary-Steadyburn Mode that will be displayed during operation. For approximately 4 seconds the Secondary-Flash Mode will be demonstrated, followed by the Primary-Steadyburn Mode.

4. To select the next mode of operation, momentarily short the yellow wires. The unit will cycle to the next mode in the list above.

Mode Number	Primary-Steadyburn Mode	Secondary-Flash Mode
1	High	Single - 60 FPM
2	OFF	Single - 60 FPM
3	Low	Single - 60 FPM
4	High	Single - 150 FPM
5	OFF	Single - 150 FPM
6	Low	Single - 150 FPM
7	High	Single - 375 FPM
8	OFF	Single - 375 FPM
9	Low	Single - 375 FPM
10	High	Neobe - 75
11	OFF	Neobe - 75
12	Low	Neobe - 75
13	High	Neobe - 150
14	OFF	Neobe - 150
15	Low	Neobe - 150
16	High	Double - 125
17	OFF	Double - 125
18	Low	Double - 125
19	High	Double - 250
20	OFF	Double - 250
21	Low	Double - 250

5. There are seven Flash Modes and three Steadyburn Modes combinations to choose from.

6. When you reach the desired mode of operation, remove power from the unit. You MUST leave power disconnected for 20 seconds BEFORE reapplying. When power is reapplied, the unit will operate as programmed above.

NOTE: If you do not leave power disconnected for 20 seconds before reapplying power, the light will default to Program Mode.

INPUT VOLTAGE RANGE: 12-24V AC or DC		
TEMPERATURE RATING: -40°C to +65°C (-40°F to 149°F)		
TYPICAL POWER CONSUMPTION AT 25°C		
Voltage Flash Mode		Steady Mode - High
12V DC	0.24 A Max	0.24 A
24V DC	0.12 A Max	0.12 A
12V AC	1.1 A rms Max	0.53 A rms
24V AC	0.22 A rms Max	0.22 A rms
NOTE: Average current draw in Flash Mode will vary by selected Flash mode. The above maximum amperage draw is stated at Single 60 FPM.		

7 Cellular Router & Antenna Installation

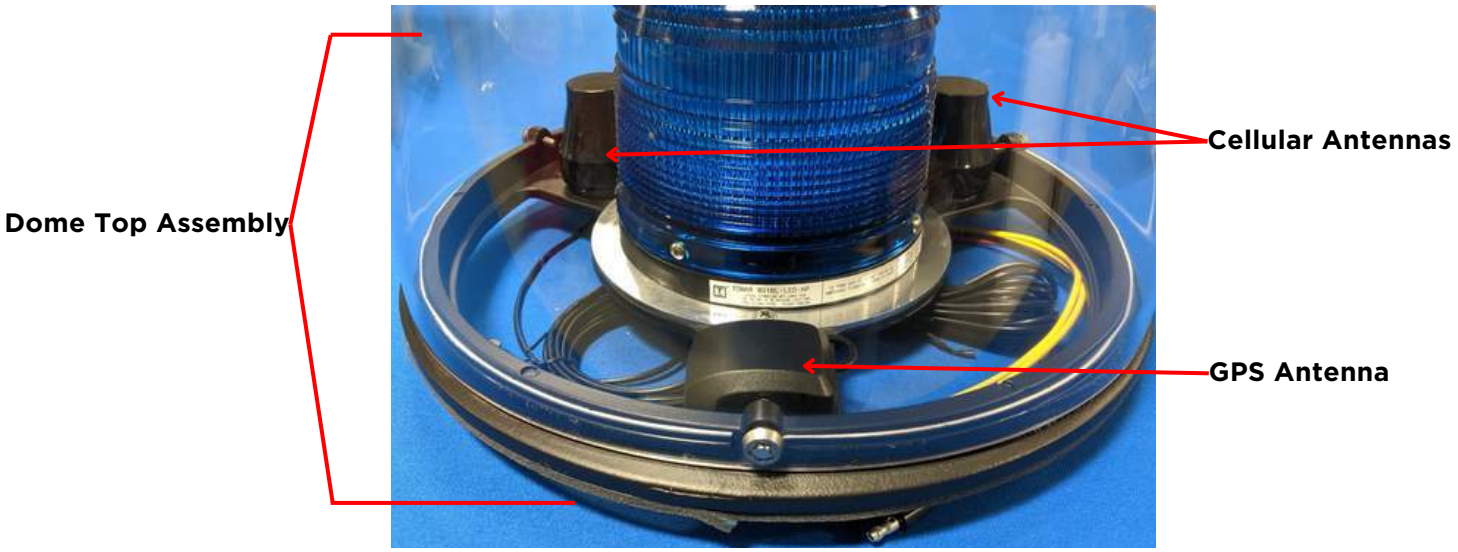
Code Blue offers Cellular Communication kits that are compatible with the **CB1-e** & **CB1-s** models. Whether you are retrofitting an existing tower or installing a new unit, the instructions below will assist in the proper placement and setup of these components.

Cellular Kit Contents

- Cellular Router
- 4G/LTE or 5G/LTE Antennas
- GPS Antenna
- Hanger Plate
- Power Supply

Note: *Some components of the cellular kit components are installed inside the dome top assembly. This does not interfere with the operation or performance of the beacon strobe. Other components are installed inside the tower, requiring the removal of the faceplate speakerphone for access.*

- **Antenna Installation**
  - The antennas are installed on the spokes of the Dome Top Assembly Casting.
    - The GPS antenna sticks to the surface of one of the spokes using the pre-installed double back tape.
    - The LTE antenna(s) is bolted to the casting spoke, through one of the pre-existing holes and using the attached bolts.
  - The antenna wires are routed down into the tower and will be connected to the Cellular Router in upcoming steps. Properly separate or label the wires to ensure they are connected correctly to the router.



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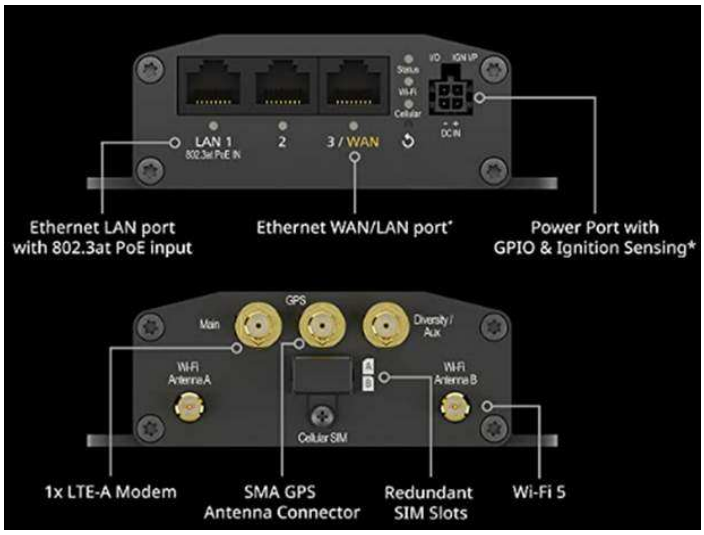
- **Cellular Router Installation**
  - The cellular router is mounted to the included hanger plate via double sided industrial hook & loop material or by drilling & tapping screw holes in the plate. Once attached to the hanger plate, the hanger plate is installed inside the tower, by hanging it on the pre-installed communication plate located across from the speakerphone opening.

(Continues on next page)

- **Antenna Wiring**
  - Connect the GPS Antenna to the GPS SMA port on the Cellular Router.
  - Connect the LTE Antennas to the "Main" SMA port and the "Diversity/AUX" SMA port on the Cellular Router.



- **Cellular Router Power**
  - The Cellular Router requires 12-24V DC to operate. Connect the supplied power supply cable to the "DC IN" port on the router. Connect the opposite end of the power supply cable to the proper incoming voltage.

- **Connection to Faceplate Speakerphone**

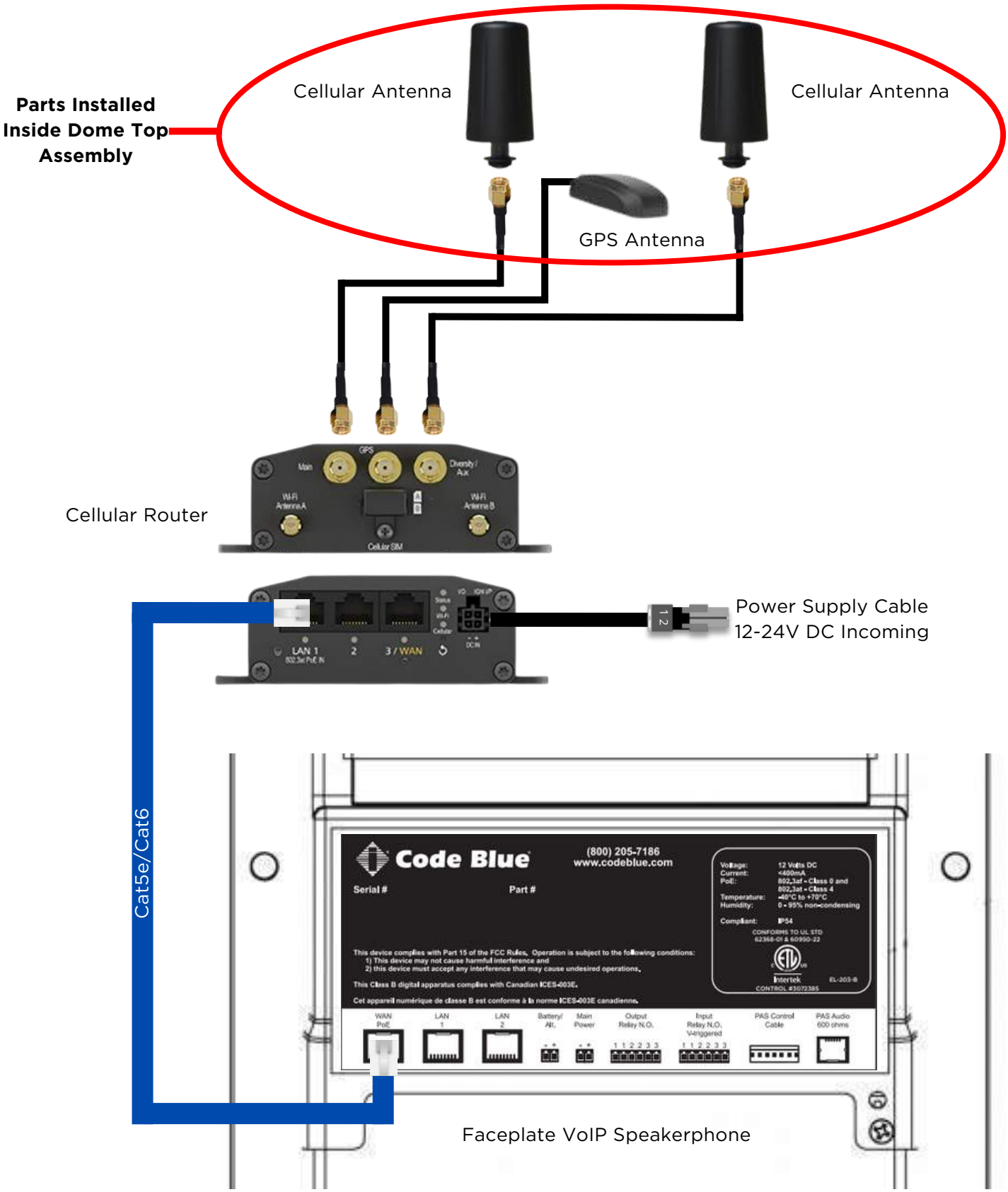
Note: Disconnect power from the Faceplate Speakerphone before proceeding with the following steps.

  - Using a Cat5e or higher rated ethernet patch cable, connect the LAN 1 port on the router to the WAN/PoE port of your VoIP Faceplate Speakerphone.
  - Prior to reconnecting power to the speakerphone, ensure that the Cellular Router has fully booted up, which is indicated by a solid green "status" LED on the router.
  - Reapply power to the Faceplate Speakerphone.

Cellular Router Status Light

- **If all steps are followed and components are installed correctly, the system would appear as pictured in the wiring diagram on the following page.**

IMPORTANT NOTE: Once installation and connections are completed, please call Code Blue Technical Support at 800-205-7186, Option 3 to complete the configuration of your cellular services. This step MUST be taken to properly activate and utilize your services as the unit will not be fully functional until then.


Parts Installed Inside Dome Top Assembly
Cellular Antenna
Cellular Antenna
GPS Antenna
Cellular Router
Power Supply Cable
12-24V DC Incoming
Cat5e/Cat6
Code Blue
(800) 205-7186
www.codeblue.com
Serial #
Part #
Faceplate VoIP Speakerphone

8 AED Access Instructions

The following four methods can be used to access the Automated External Defibrillator (AED) device:

1. When the red button is depressed, the unit will make a call. After the call has been answered, the answering party can then depress the appropriate in call command on their telephone keypad. This will release the door latch, giving the caller access to the AED device.
2. Units purchased before 2024 included a key fob at the time of purchase. This key fob can be used within approximately a 20-foot radius to release the door latch, giving the caller access to the AED device.
3. The unit can be called and placed into two-way monitor mode. At this time, the person calling the unit can depress the 6 key on their telephone keypad which, will provide access to the AED device.
4. The access panel on the back of the Code Blue unit is removed and the manual latch release is pulled, granting access to the AED device.

Typically, AED manufacturers recommend that the device be checked once per week for proper operation. Some units will give an audible “chirp” if the self diagnostics have failed and the unit needs service; others may use another indicator to verity its status. Refer to manufacturers’ maintenance instructions for correct diagnostic testing to ascertain whether the device requires service or not.

In addition, review the manufacturer’s replacement policy for pad and battery replacement. Pay close attention to the AED temperature specifications and note that the life of the AED battery can be greatly affected by extreme heat or cold environments, reducing the capacity by up to 50 percent.

AED Key Fobs
IMPORTANT NOTE: Replacement or additional key fobs are no longer available from Code Blue. The instructions below refer to connecting a key fob to work with units purchased prior to 2024.

Each Code Blue unit can sync up to 40 different fobs. If a new user key fob is added, then the rule is “first in, first out”. For example, No. 41 will push out the first user of the system.

PROGRAMMING:
Open the Code Blue unit (Code Blue security bit is required). Once inside, you will see the door controller (pictured below).

To program, insert a small screw driver into the hole next to the green light and hold down the button inside. When the green light starts flashing, hold down the button on the FOB until the green light is solid. The fob and controller will be synced.

9 Power Requirements

The following tables on pages 32-35 include **CB1** and ALL OTHER Code Blue devices & enclosures for reference.

Faceplates	Voltage	Max Current	Max Watts	Norm Current	Norm Watts	KWHrs
IA4100	24V AC	0.40	9.60	0.22	5.28	0.13
	12V DC	0.90	10.80	0.39	4.68	0.11
	24V DC	0.90	21.60	0.39	9.36	0.22
IP5000	24V AC	0.10	2.40	0.07	1.68	0.04
	12V DC	0.19	2.28	0.15	1.80	0.04
	24V DC	0.19	4.56	0.15	3.60	0.09
Centry	12VDC	0.50	6.00	0.38	4.56	0.11
LS1000/LS2000	12V DC	0.50	3.60	0.40	4.80	0.12
Lights	**Voltage**	**Max Current**	**Max Watts**	**Norm Current**	**Norm Watts**	**KWHrs**
s-1000/S-2000 LED Strobe	24V AC	0.28	6.72	0.22	5.28	0.13
	12V DC	0.26	3.12	0.24	2.88	0.07
	24V DC	0.26	6.24	0.24	5.76	0.14
A-700 Area Light	24V AC	1.80	43.20	0.83	19.92	0.48
	12V DC	2.68	32.16	0.38	4.56	0.11
	24V DC	2.68	64.32	0.38	9.12	0.22
S-1050 LED Strobe W/ Photocell	24V AC	0.28	6.72	0.22	5.28	0.13
	12V DC	0.27	3.22	0.24	2.88	0.07
	24V DC	0.27	6.43	0.24	5.76	0.14
LED Light Bar	24V AC	0.04	0.96	0.04	0.96	0.02
	12VDC	0.04	0.48	0.04	0.48	0.01
	24V DC	0.04	0.96	0.04	0.96	0.02
WM180 PAS With LED Strobe	12-24V DC	7.30	175.20	2.10	50.40	1.21

Models With IA4100 Faceplate	Voltage	Current	Watts	KWHrs
CB 1-e	24V AC	0.48	11.52	0.28
	12VDC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 1-s	24V AC	1.31	31.44	0.75
	12V DC	1.05	12.60	0.30
	24V DC	1.05	25.20	0.60
CB 5-s	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 9-s	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 2-e	24V AC	0.44	10.56	0.25
	12VDC	0.63	7.56	0.18
	24V DC	0.63	15.12	0.36
CB 2-a	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39
CB 2-s	24V AC	1.31	31.44	0.75
	12V DC	1.05	12.60	0.30
	24V DC	1.05	25.20	0.60
CB 2 w/ Audio Paging	12-24V DC	6.44	154.56	3.71
CB 4-s	24V AC	0.22	5.28	0.13
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB 4-r	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 4-u	24V AC	0.26	6.24	0.15
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 6-F & CB 6-S	24V AC	0.22	5.28	0.13
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB RT	24V AC	0.48	11.52	0.28
	12V DC	0.67	8.04	0.19
	24V DC	0.67	16.08	0.39

Models With IP5000 Faceplate	Voltage	Current	Watts	KWHrs
CB 1-e	24V AC	0.33	7.92	0.19
	12VDC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 1-s	24V AC	1.16	27.84	0.67
	12V DC	0.81	9.72	0.23
	24V DC	0.81	19.44	0.47
CB 5-s	24V AC	0.33	792.00	0.19
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 5-s	24V AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 2-e	24V AC	0.29	6.96	0.17
	12V DC	0.39	4.68	0.11
	24V DC	0.39	9.36	0.22
CB 2-a	24V AC	0.33	7.92	0.19
	12VDC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25
CB 2-s	24V AC	1.16	27.84	0.67
	12V DC	0.81	9.72	0.23
	24VDC	0.81	19.44	0.47
CB 2 w/ Audio Paging	12-24V DC	6.44	154.56	3.71
CB 4-S	24V AC	0.07	1.68	0.04
	12V DC	0.15	1.80	0.04
	24V DC	0.15	3.60	0.09
CB 4-r	24V AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 4-u	2av AC	0.11	2.64	0.06
	12VDC	0.19	2.28	0.05
	24V DC	0.19	4.56	0.11
CB 6-F & CB 6-S	24VAC	0.07	1.68	0.04
	12V DC	0.15	1.80	0.04
	24V DC	0.15	3.60	0.09
CB RT	24V AC	0.33	7.92	0.19
	12V DC	0.43	5.16	0.12
	24V DC	0.43	10.32	0.25

Models with LS1000/LS2000	Voltage	Current	Watts	KWHrs
CB 1-e	12V DC	0.68	8.16	0.20
CB 1-s	12V DC	1.06	12.72	0.31
CB 5-s	12V DC	0.68	8.16	0.20
CB 9-S	12V DC	0.44	5.28	0.13
CB 2-e	12V DC	0.64	7.68	0.18
CB 2-a	12V DC	0.68	8.16	0.20
CB 2-s	12V DC	1.06	12.72	0.31
CB 4-s	12V DC	0.40	4.80	0.12
CB 4-r	12V DC	0.44	5.28	0.13
CB 4-U	12V DC	0.44	5.28	0.13
CB 6-F & CB 6-S	12V DC	0.40	4.80	0.12
CB RT	12V DC	0.68	8.16	0.20

High Voltage Models	Voltage	Current	Watts	KWHrs
CB 1 w/ Audio Paging	12-24V DC	3.83	460	11
CB 5 w/ Audio Paging	12-24V DC	3.33	400	9.6
CB 1 w/ NightCharge	120V AC	2.5	300	2.4
CB 4-U w/ NightCharge	120V AC	2.5	300	2.4

High Voltage AC Components	Voltage	Current	Watts	KWHrs
Multi-Tap Power Supply	120V AC	1.75A/210VAC	210	5.04
DIN Rail Power Supply	120V AC	1.2A/115VAC	115	2.76
Audio Paging Amp	12-24V DC	3.83	459.6	11.03

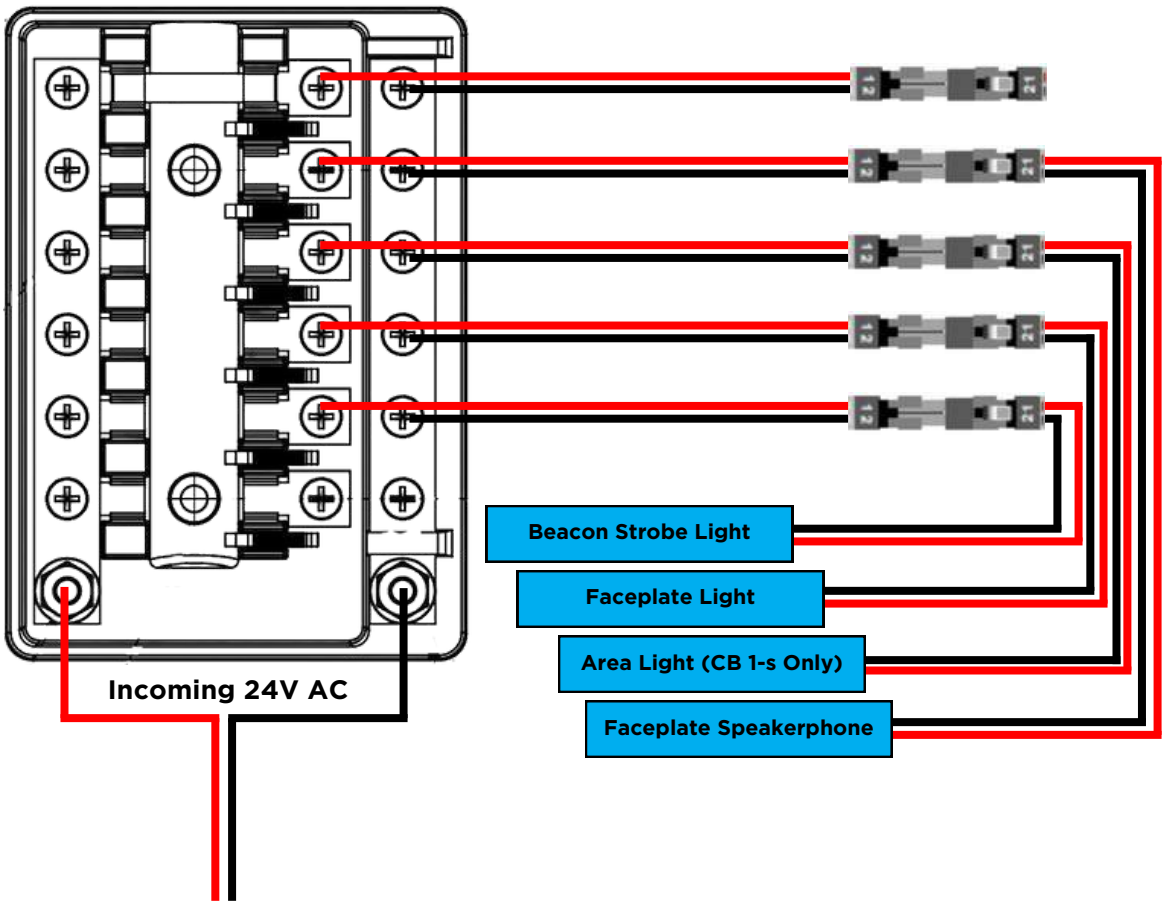
10 Wiring Diagrams

CB 1-e & CB 1-s 24V AC Standard Wiring

For installations with 24V AC incoming power on site.

Used in the following configurations:

- **Standard CB 1-e - No Cellular or Audio Paging Options**
- **Standard CB 1-s - No Cellular or Audio Paging Options**



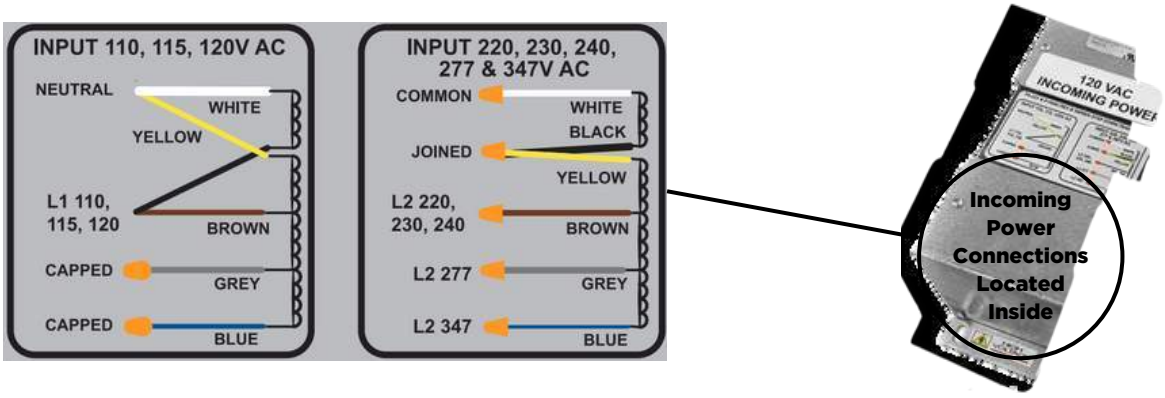
CB 1-e & CB 1-s 110-347V AC Standard Wiring with Multi-Tap Transformer (Power Brick)

For installations with 110-347V AC incoming power on site.

Used in the following configurations:

- **Standard CB 1-e - No Cellular or Audio Paging Options**
- **Standard CB 1-s - No Cellular or Audio Paging Options**
- **CB 1-e w/ Cellular Communication**
- **CB 1-s w/ Cellular Communication**

Incoming power connection configurations:



Output Options:

Red/Black Wires - 24V AC @ 5 Amps
5 x Fused Outputs

Red/White Wires - 12V DC @ 5 Amps
5 x Fused Outputs

Fused outputs come pre-labeled to assist in connecting the following equipment:

- **Faceplate speakerphone (12V DC ONLY)**
- **Faceplate Light**
- **Beacon Strobe**
- **Area Light (CB 1-s Only)**

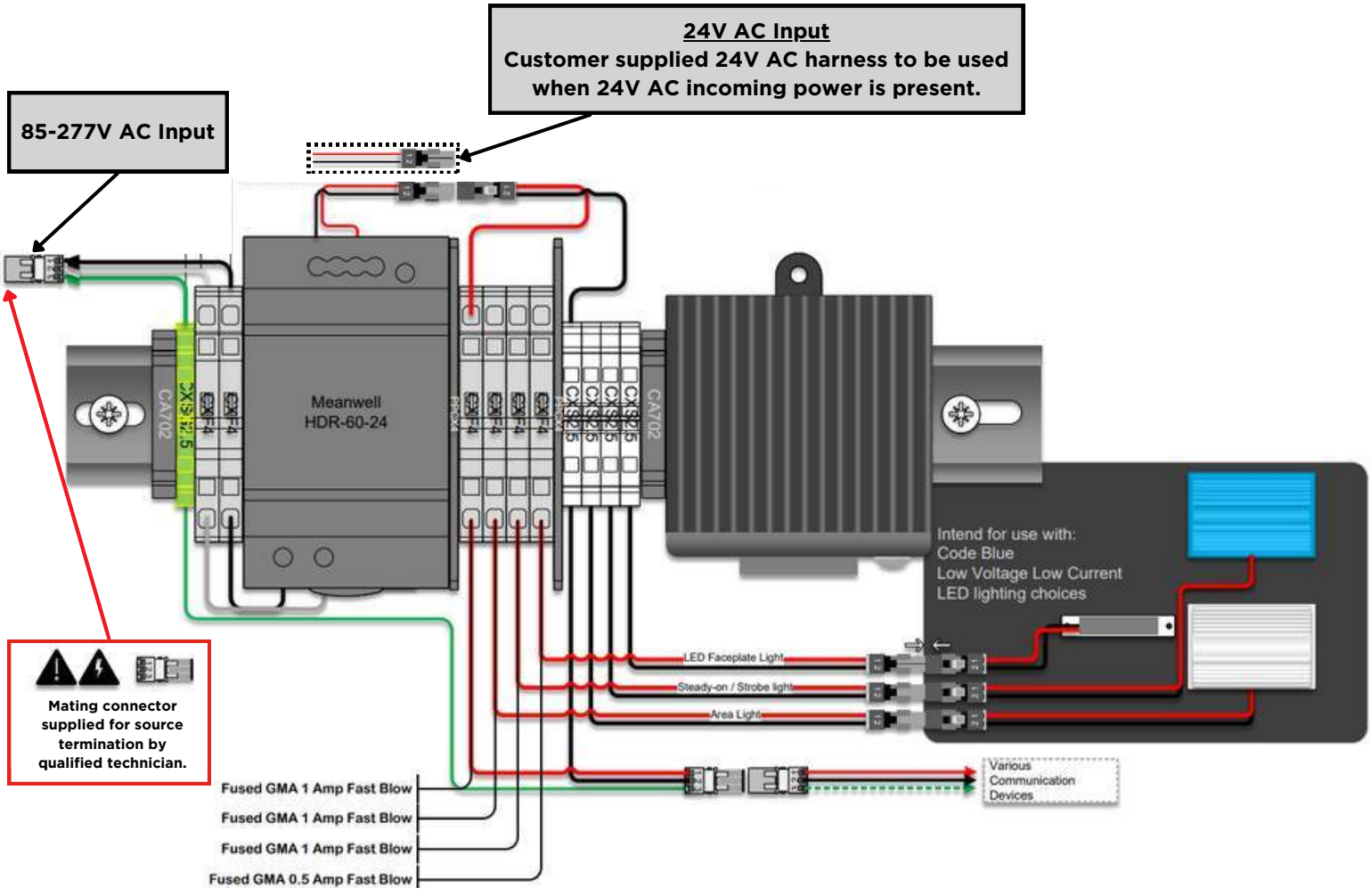
Remaining outputs can be used for accessory equipment selected at time of ordering.

CB 1-e & CB 1-s 24-277V AC DIN Rail Power System

For installations with 24-277V AC incoming power on site. Provides flexibility for future power updates compared to the 24V AC only option detailed on page 25.

Used in the following configurations:

- **Standard CB 1-e - No Cellular or Audio Paging Options**
- **Standard CB 1-s - No Cellular or Audio Paging Options**
- **CB 1-e w/ Cellular Communication**
- **CB 1-s w/ Cellular Communication**



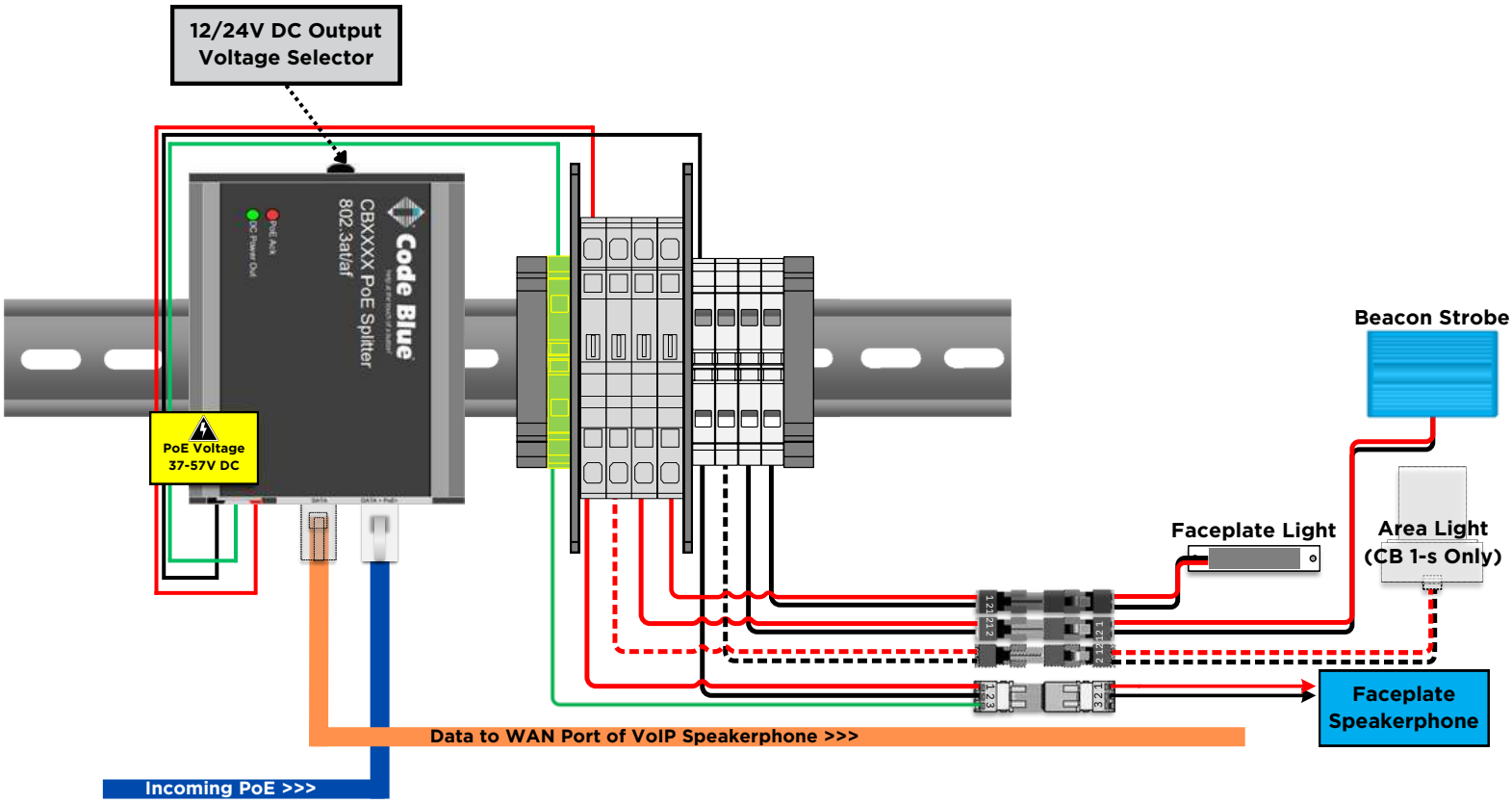
DIN Rail Layout

CB 1-e & CB 1-s PoE DIN Rail Power System

For installations with PoE incoming power on site.

Used in the following configurations:

- **Standard CB 1-e - No Cellular or Audio Paging Options**
- **Standard CB 1-s - No Cellular or Audio Paging Options**



DIN Rail Layout

Order of Connection

1. **Connect Lighting & Communication devices to power system via Wago plug & socket connectors.**
2. **Connect RJ45 ethernet cable (Cat5e or Cat6) from "Data" port on PoE splitter to the WAN port of the VoIP speakerphone.**
3. **Plug incoming PoE ethernet RJ45 cable (Cat5e or Cat6) into "Data + PoE" port on PoE splitter. Splitter will light up accordingly indicating passing of DC voltage.**

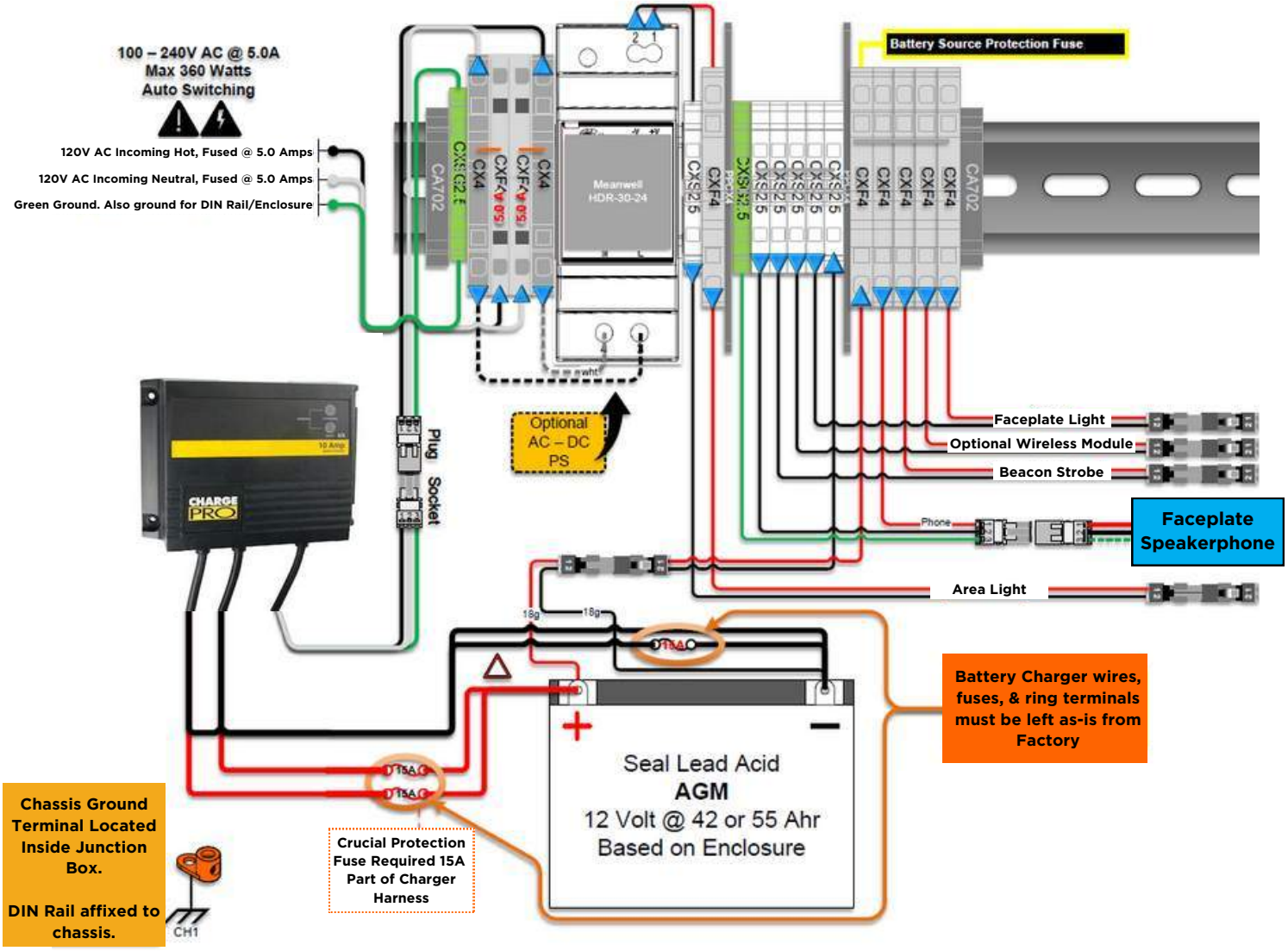
IMPORTANT NOTE: **LS1000 speakerphones operate on 12V DC only. If the 24V DC output is selected on the PoE splitter, the use of a 24V to 12V DC step-down transformer must be installed prior to connecting the power system to the speakerphone.**

CB 1-s with NightCharge® DIN Rail Power System

For installations with 100-240V AC incoming power, utilizing the NightCharge® switch-grid power system.

Used in the following configurations:

- **Standard CB 1-s - No Cellular or Audio Paging Options**
- **CB 1-s w/ Cellular Communication**



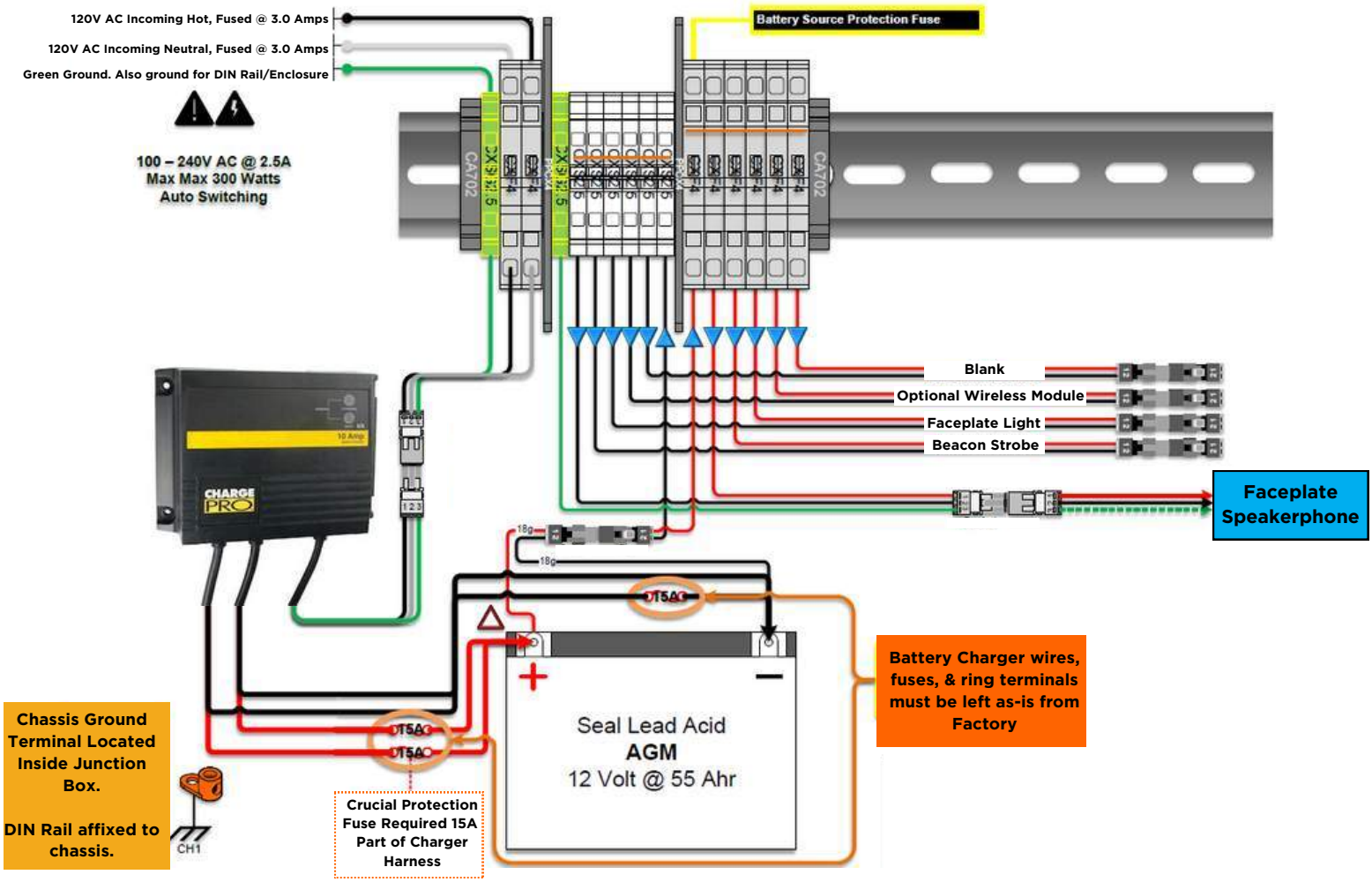
DIN Rail Layout

CB 1-e with NightCharge® DIN Rail Power System

For installations with 100-240V AC incoming power, utilizing the NightCharge® switch-grid power system.

Used in the following configurations:

- **Standard CB 1-e - No Cellular or Audio Paging Options**
- **CB 1-e w/ Cellular Communication**



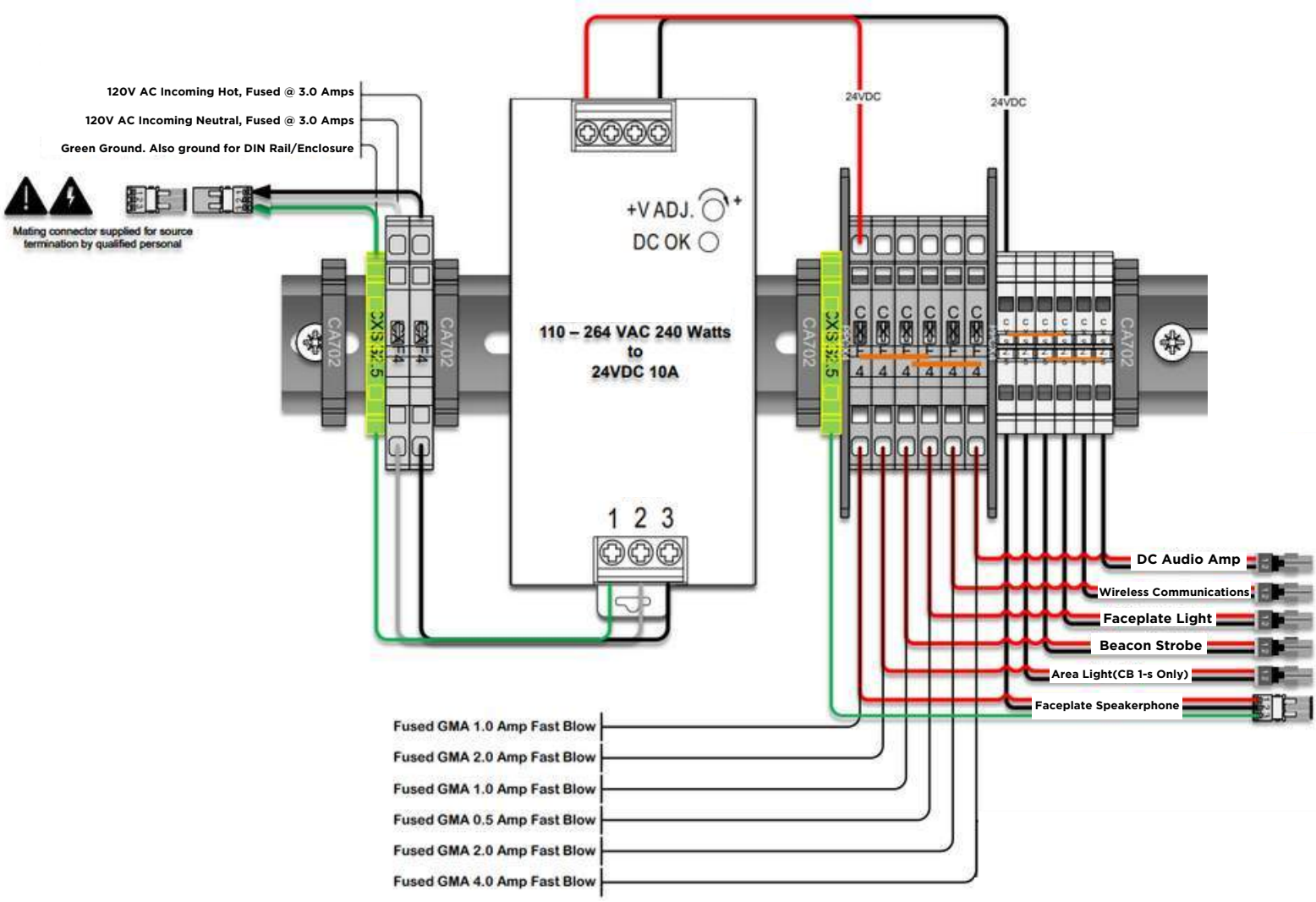
DIN Rail Layout

CB 1-e & CB 1-s with Audio Paging DIN Rail Power System

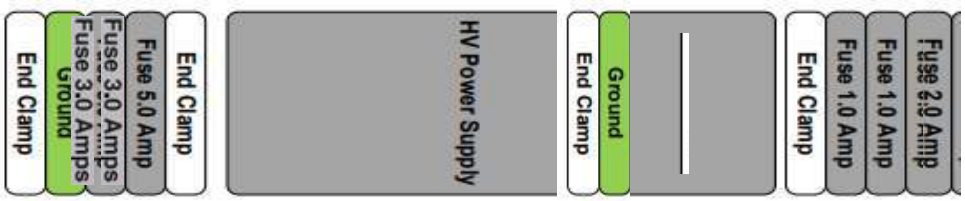
For installations with 100-240V AC incoming power, utilizing 360° Audio Paging speaker array.

Used in the following configurations:

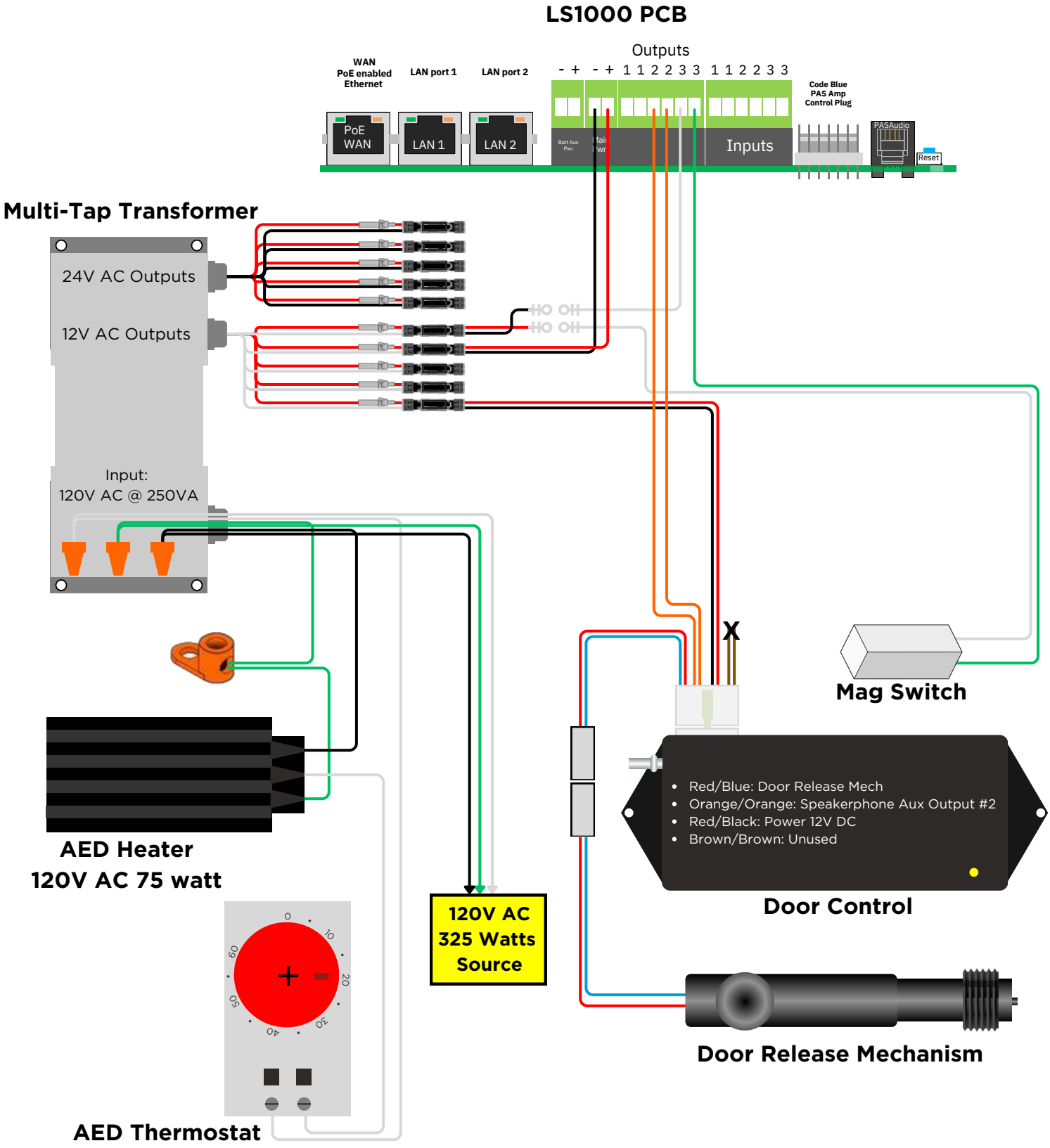
- **CB 1-e with 360° Audio Paging Top (With or without cellular communication)**
- **CB 1-s with 360° Audio Paging Top (With or without cellular communication)**



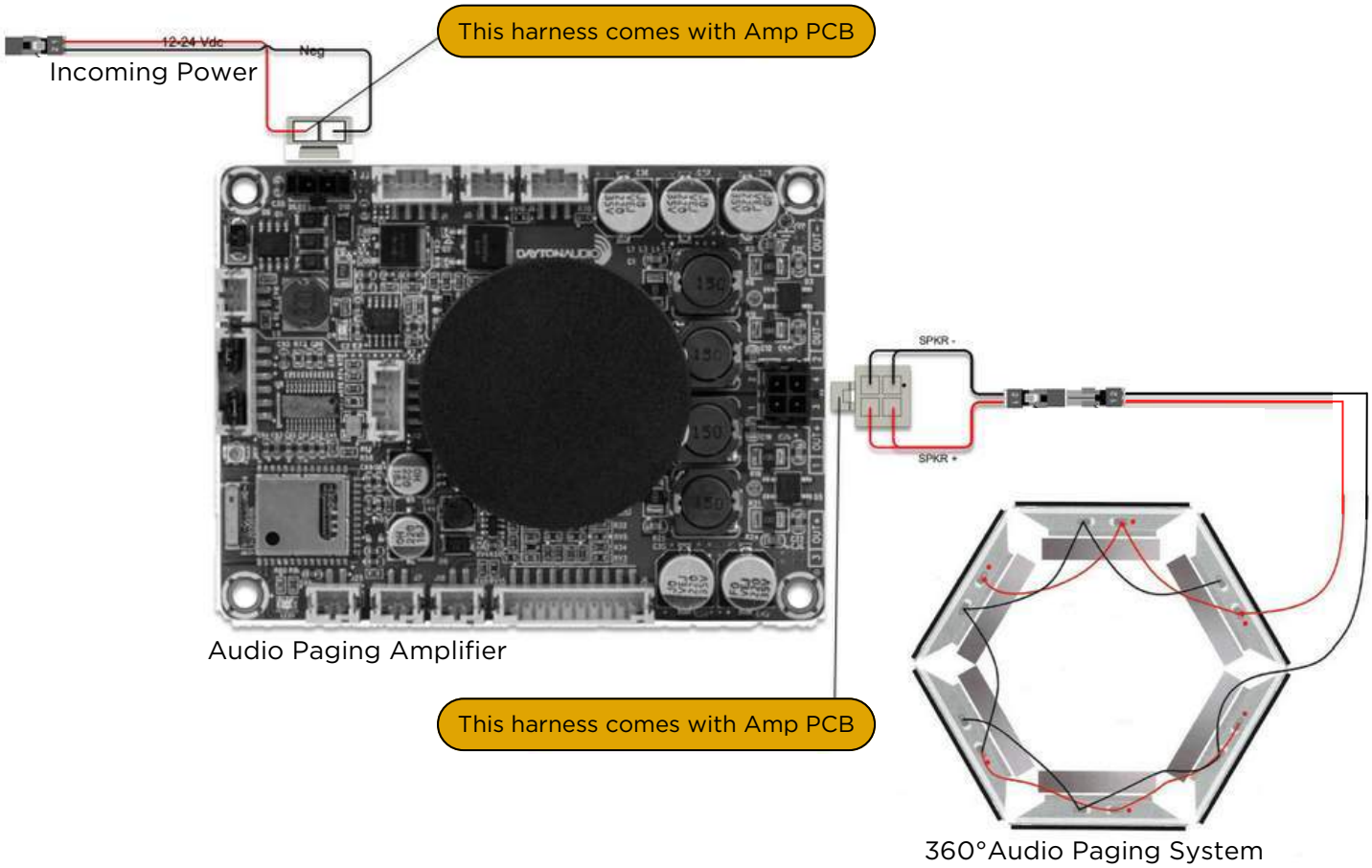
DIN Rail Layout



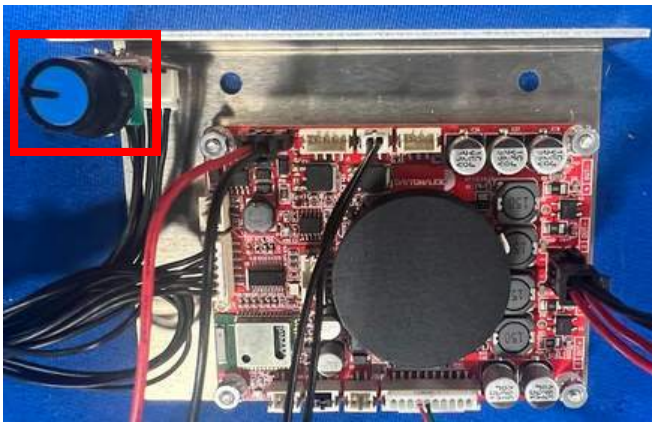
CB 1-e & CB 1-s with AED Cabinet



360°Audio Paging Amplifier Wiring & Volume Control



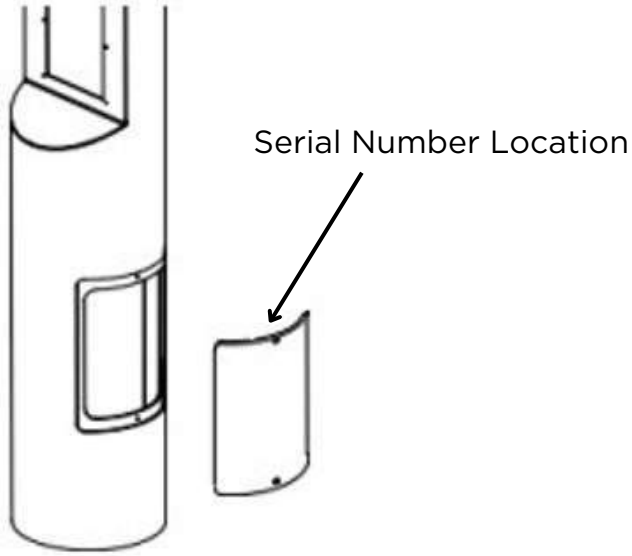
- **Locate Volume Adjustment Knob on Paging Amp** - See location in below photo



- **Adjust Volume to Desired Level** - By turning the knob clockwise or counter clockwise, this will increase or decrease the volume level of the Audio Paging Speaker Array.

11 Locating Unit Serial Number

Remove the access door with the special security bit. The serial number will be listed on the manufacturer's label located on the backside of the access door.



12 Maintenance Schedule

LEGEND

G Guard Tasks T Technician Tasks

DAILY OR WEEKLY

G **Perform functional communications check.**
- Action: Press Red Button
  - Strobe activates
  - Red LED "Call Placed" light turns on
  - Message plays
  - Call connects, green LED "Call Received" light turns on
  - Confirm conversation clarity with dispatch

MONTHLY OR QUARTERLY

G **Visually check lighting functions:**
- Faceplate light
- Beacon/Strobe

G **Visually inspect unit for damage to**:
- Faceplate
- Piezo Button
- Microphone
- Speaker

T **Check Batteries:**
- Functioning with full charge.
- Recharging fully, including NightCharge®/Solar Units(Note: Mid-to-late afternoon inspection is recommended)

IMPORTANT NOTE: Depending on the environment in which the batteries are installed, it is recommended that batteries for Solar & NightCharge® products are fully replaced every 2-3 years.

BIANNUALLY

T **Remove access door and faceplate assembly to inspect the following:**
- Ensure all electrical connections are secure
- Check all phone connections for corrosion *(If corroded, clean and coat with dielectric gel or replace)*
- Ensure all battery connections are tight and clean
- Verify no stains exist around gasket areas (stains indicate leaking & gasket should be replaced)
- Verify moisture weep hole on cabinet bottom is open and unobstructed
- Verify bottom of bollards are at least 1/2 inch above footing and free of obstructions (only applies to CB1, CB5, CB9, & CBRT units)

G **Apply automotive paint sealant to unit exterior for protecting finish against environmental pollutants (Suggested products include Black Magic Wet Shine Liquid Wax, Nu Finish NFP-80, and 5 Star Shine)**

G **Clean & coat exterior stainless steel cabinets with cleaner/polish (Suggested products include Chase Products' Champion Spray-on Stainless Steel Cleaner to help protect finish against environmental pollutants)**

T **Visually confirm line-of-sight is still clear to base station (i.e., confirm that new tree growth, new building construction or other obstructions are not bloacking view of base station)**

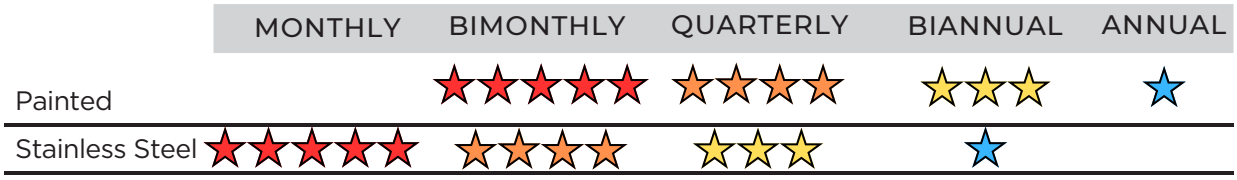
UNIT SURFACE MAINTENANCE

The painted and stainless steel Code Blue models require periodic care to sustain their aesthetic appearance. Units located outdoors are vulnerable to harsh environmental conditions, including UV rays, acid rain, diesel fumes and airborn iron particles (i.e., dust) which over time may cause unit discoloring. To prevent pollutants developing harmful chemical reactions on Code Blue units, an appropriate surface maintenance schedule should be adhered to. The Surface Care Frequency table below provides general guidelines to assist in configuring a schedule. Please note that the frequency of care required to guard the Code Blue unit's surface from damage will also be dictated by local environmental characteristics.

LEGEND: POLLUTANTS LEVEL

Low	★
Low/Moderate	★★
Moderate	★★★
Moderate/High	★★★★
High	★★★★★

SURFACE CARE FREQUENCY



See scheduled tasks under Biannually for suggested paint sealants or stainless steel cleaners.

AVERAGE COMPONENT LIFE

Component life is based on various mechanical, operational and environmental factors. Your local Code Blue reseller can assist you with a regularly scheduled maintenance program customized to your individual site requirements.

Code Blue strongly recommends contacting a local CB reseller to establish a proactive maintenance schedule.

13 Warranty

Code Blue Corporation provides a limited warranty on this product. Refer to your sales agreement to establish the terms. In addition, Code Blue's standard warranty language, as well as information regarding support for this product while under warranty, is available at **www.codeblue.com/support**

In Case of Breakdown

In case of system breakdown, discontinue use and contact Tech Support at:

technicalsupport@codeblue.com or call **800-205-7186, option 3**.

In Case of Abnormal Operation

If the unit emits smoke or an unusual smell, if water or other foreign material enters the enclosure, or if you drop the unit or damage the enclosure, power off the unit immediately and contact Code Blue Customer Service at:

customerservice@codeblue.com or call **800-205-7186, option 2**.

14 Download Information

Code Blue now has a centralized location where you can find installation, setup, information, configuration and operation instructions.

Admin Guides: www.codeblue.com/resources/guides
Frimware: www.codeblue.com/resources/firmware
Maintenance Tips: www.codeblue.com/support
Product Sheets: www.codeblue.com/resources/sheets
Specifications: www.codeblue.com/resources/specifications

These guides should contain all the information needed for your application. If further information is required, please contact **customerservice@codeblue.com**.

15 Legal & Regulatory Information

Legal Considerations

Video and audio surveillance can be regulated by laws that vary from country to country. Check the laws in your local region before using this product for surveillance purposes.

Liability

Every care has been taken in the preparation of this document. Please inform Code Blue Corporation of any inaccuracies or omissions. Code Blue cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice. Code Blue makes no warranty of any kind with regard to the material contained within this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Code Blue shall not be liable or responsible for incidental or consequential damages in connection with the furnishing, performance or use of this material. This product is only to be used for its intended purpose.

Intellectual Property Rights

Code Blue Corporation has intellectual property rights relating to technology embodied in the product described in this document. This product contains open source code that also contains additional open source libraries.

Equipment Modifications

This equipment must be installed and used in strict accordance with the instructions given in the user documentation. This equipment contains no user-serviceable components. Unauthorized equipment changes or modifications will invalidate all applicable regulatory certifications and approvals.

Trademark Acknowledgments

Code Blue and Centry products are registered trademarks or trademark applications of Code Blue Corporation in various jurisdictions. All other company names and products are trademarks or registered trademarks of their respective companies.

Regulatory Information

Electromagnetic Compatibility (EMC)

This equipment has been designed and tested to fulfill applicable standards for:

- Radio Frequency emission when installed according to the instruction and used in the intended environment.
- Immunity to electrical and electromagnetic phenomenon when installed according to the instructions and used in its intended environments.

USA

This equipment has been tested using a shielded network cable (STP) and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. The product shall be connected using a shielded network cable (STP) that is properly grounded.

Canada

This digital apparatus complies with CAN ICES-3 (Class A). The product shall be connected using a shielded network cable (STP) that is properly grounded.

Cet appareil numérique est conforme à la norme NMB ICES-3 (classe A). Le produit doit être connecté à l'aide d'un câble réseau blindé (STP) qui est correctement mis à la terre.

Disposal and Recycling

When this product has reached the end of its useful life, dispose of it according to local laws and regulations. For information about your nearest designated collection point, contact your local authority responsible for waste disposal. In accordance with local legislation, penalties may be applicable for incorrect disposal of this waste.

This guide should contain all the information needed for your application. If any further information is needed, please contact **customerservice@codeblue.com.**

Support

Should you require any technical assistance, please contact Code Blue.

Visit **codeblue.com** to:

- Download user documentation and software.
- Find answers to resolved problems in the FAQ database.

Report problems to Code Blue Technical Support via email at:

technicalsupport@codeblue.com or **800-205-7186**

SECTION 293600

NATIVES SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Natives Seeding

1.02 RELATED SECTIONS:

A. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

B. Section 312000: Earthwork.

C. Section 320514: Topsoil.

1.03 SUBMITTALS:

A. Submit under provisions of Section 013000: Submittals.

B. All plant material shall be true to species and shall originate from the same EPA Level III as the site Ecoregion or an adjacent EPA Level III Ecoregion.

C. All species substitutions must be approved by the ENGINEER.

D. All seed shall be PLS (Pure Live Seed) tested to ensure seed is of high quality. Seed quantities shall be adjusted to ensure a minimum of 85% PLS, according to the test results.

E. Submit test results demonstrating acceptable topsoil to the ENGINEER for approval prior to placement.

1.04 PERFORMANCE STANDARD

A. All seeded areas will be inspected by the OWNER at the end of the first growing season for health, vigor, and signs of erosion and bare areas. All bare areas larger than 10 square feet will require reseeding with the seed mix appropriate to that location. Final acceptance of seeded areas will require 90 percent vegetative cover of originally seeded areas. All seeding applications must comply with the requirements of the Contract Documents.

1.05 REGULATORY REQUIREMENTS:

A. Comply with regulatory agencies for herbicide composition.

1.06 QUALIFICATIONS:

A. Seed Supplier: Company specializing in growing and cultivating applicable plant species.

B. Installer: Michigan State University – Landscape Services

C. Maintenance Services: Shall be provided by the installer.

1.07 DELIVERY, STORAGE, AND HANDLING:

A. Deliver seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

1.08 COORDINATION:

A. Coordinate work with CONTRACTOR.

1.09 MAINTENANCE SERVICE:

A. Maintain seeded areas immediately after placement until grass is well established, exhibits a vigorous growing condition and is accepted by OWNER. Guarantee reseeding of bare areas for one year following acceptance.

B. OWNER should plan on watering freshly seeded areas with 1" water a week minimum until vegetation has grown 6" and thickens.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil, Landscape:
   1. Topsoil shall be supplied by OWNER and installed by CONTRACTOR.

B. Seed Mixtures:

   1. Seeding, Riverbank Native Seed Mix (apply a minimum rate of 7.8 lbs/acre):

Scientific Name	Common Name	PLS Oz Per Acre
Asclepias incarnata	Swamp milkweed	2
Calamagrostis canadensis	Blue-joint	2
Campanulastrum americanum	Tall bellflower / American bellflower	0.5
Carex grayi	Common bur sedge	1
Carex muskingumensis	Swamp oval sedge	1
Cinna arundinacea	Wood reedgrass / common wood reed	2
Elymus hystrix	Bottlebrush grass	6
Elymus riparius	Riverbank wild rye	48
Elymus virginicus	Virginia wild rye	48
Eutrochium maculatum	Spotted joe-pye weed / joe-pye weed	1
Iris virginica	Southern blue flag / blue flag iris	1
Lobelia cardinalis	Red lobelia / cardinal flower	1
Lobelia siphilitica	Great blue lobelia	1
Monarda fistulosa	Wild bergamot	3
Rudbeckia laciniata	Wild golden glow / cut-leaf coneflower	3
Symphyotrichum lateriflorum	Calico aster / side-flowering aster	1
Symphyotrichum novae-angliae	New England aster	1
Zizia aurea	Golden Alexanders	2

Scientific Name	Common Name	PLS Oz Per Acre
Temporary Cover Crop		
Avena sativa	Seed oats	512
Lolium multiflorum	Annual Rye	80

C. Erosion Control Blanket:
   1. OWNER shall install North American Green C125BN and Rolanka BIO-D 70 erosion control blanket per the detail on the plans.

PART 3 - EXECUTION

3.01 TIMING

A. Native Seed for this project shall be installed immediately following earthwork and prior to placement of erosion control fabric or loose mulch, unless otherwise approved by ENGINEER

B. The seeding must be done from April 1 to June 15 or from September 15 to first frost. Optimal wetland seeding time is October 1 through first frost to allow repeat freeze-thaw cycles to incorporate the seed into the substrate and provide cold stratification to break seed dormancy. Complete the seeding before June 15 or after September 15 of a given calendar year. Ensure seeding is not being performed during periods of snow cover.

C. If restoration need occur outside of the seeding window, provide plenty of water to all seeded areas.

3.02 METHODS

A. Seed shall be installed utilizing one of the following methods:
   1. Seed shall be installed by hand broadcasting or by utilizing a no-till native seed drill (Truax, Tye, Great Plains, or approved equal) OR a native drop seeder (Truax Trillion seeder). Only seeding equipment manufactured for native seed installation shall be utilized. Seed shall not be placed more than 1/8 inch into the soil.
   2. In areas too wet or too small to seed with machinery, seed shall be hand-broadcast by incorporating seed into wet soil clumps and distributing throughout target area. The ENGINEER must approve use of this technique prior to implementation and must be present at the start of implementation to ensure proper execution.
   3. Seed shall not be installed via hydroseeding equipment under any circumstances.

3.03 FERTILIZER

A. No fertilizer shall be used.

3.04 EROSION CONTROLS

A. Seed shall be covered with erosion control blanket.

3.05 MAINTENANCE

A. Immediately reseed areas that show bare spots.

B. Perform watering for a minimum of 45 days after seeding or until vegetation has established.

C. Perform spot herbicide applications to invasive species during the growing season. Do not perform applications outside of the growing season.

D. Correct all erosion and restore with seed.

END OF SECTION

SECTION 311400 – SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This Section includes sod and topsoil stripping.

C. Related sections include the following:

1. Division 01 Section “General Requirements - Temporary Facilities and Controls.”
2. Division 02 Section “Site Demolition.”
3. Division 31 Section “Earthwork.”

1.3 DEFINITIONS

A. Topsoil: Friable clay loam surface soil containing 2.5% to 12% organic matter. Topsoil shall be free of subsoil, clay lumps, stones, rocks, weeds, roots, construction debris, and other unsuitable materials as determined and approved by the Project Representative.

1.4 PLANT PROTECTION

A. Refer to Division 01 Section “General Requirements - Temporary Facilities and Controls.”

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 SOD STRIPPING

A. Stripping and stockpiling sod shall be done under reasonably dry conditions. Secure approval of soil quality in advance from the Project Representative to begin sod stripping. Sod removal shall include the entire root system but not an excess amount of topsoil. Contractor shall haul the sod to a campus location, as directed.

3.2 TOPSOIL STRIPPING

A. Stripping and stockpiling topsoil shall be done under reasonably dry conditions. Stripping and stockpiling under wet conditions will not be allowed.

B. Contractor shall strip available topsoil to its full depth from within the Contract limits, excluding areas in close proximity to trees designated to remain, unless otherwise specified or directed by the Project Representative.

C. Contractor shall stockpile topsoil in a storage pile in an area shown on the Drawings or as directed by the Project Representative. Storage pile shall be shaped to freely drain surface water during and after stockpiling operations. Excess topsoil shall be removed from campus by the Contractor unless directed otherwise prior to bidding. The stockpile shall be protected from soil and sediment erosion as required elsewhere in these Specifications.

END OF SECTION 311400

SECTION 312300 – EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. Related sections include the following:

1. Division 01 Section 15000-TEMPORARY FACILITIES AND CONTROLS
2. Division 02 Section 024116-SITE DEMOLITION
3. Division 31 Section 311400-SITE CLEARING
4. Division 32 Section 321216-BITUMINOUS PAVEMENT
5. Division 32 Section 321313-CONCRETE PAVEMENT

C. Approved Topsoil Installation Contractors shall bid directly to and be contracted directly by the General Contractor or Construction Manager.

D. Approved Topsoil Installation Contractors:

1. Anderson Fischer Associates Inc., 225 E. Kipp Rd, Mason MI 48854-1946 (517) 676-5522

2. Carols Excavating Inc., 5103 Lansing Rd, Charlotte MI 48813 (517) 645-0670

3. Central Excavating LLC , 11303 W Price Rd, Westphalia MI 48894-8208 (517) 749-2566

4. E.T. MacKenzie, 4248 W. Saginaw Highway, Grand Ledge MI 48837 (517) 627-8408

5. Eagle Excavation Inc., 4295 Holiday Drive, Flint MI 48507 (810) 767-7878

6. Owner Pre-Approved Topsoil Installation Contractor

E. Testing and inspection agency will be under contract with the contractor and will perform QA activities of the material below all pavements and structures.

1.3 DEFINITIONS

A. Excavation: Removal of material encountered to indicated subgrade elevations and subsequent disposal of materials removed. Excavation material is unclassified.

B. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction by the Project Representative. Unauthorized excavation shall be at the Contractor's expense. Undermining of existing footings or disturbing the bearing soil shall not be permitted unless it is specifically indicated or specified in the Contract Documents.

C. Additional Excavation: When excavation has reached required subgrade elevations the Contractor shall notify the Project Representative who will inspect conditions. If the Contractor encounters unsuitable bearing materials at the required subgrade elevations Contractor shall carry excavations deeper and replace excavated material as directed by the Project Representative. Removal of unsuitable material and its replacement, as directed, is part of this Contract.

D. Backfilling: Placement of fill soil, either provided on site or Contractor-furnished, which shall be uniformly compacted to the required density.

E. Bedding: The material placed around a utility between 4 inches below to 12 inches above the utility the full width of the trench.

F. Building Compacted Areas: Areas under slabs on ground within the building line. Exterior concrete slabs attached to the building, such as entrances, shall be considered within the building line.

G. Contract Limits: Those areas of the project site on which, or upon which, work will be done in accordance with the Contract.

H. Fill: Imported material which is placed in structure undercut.

I. Imported Material: Soil material which is purchased by Contractor and hauled onto the site.

J. MDOT: Michigan Department of Transportation's Standard Specifications for Construction, 2012.

K. Proof-Rolling: The use of a loaded 10 CY capacity or larger truck driven over the subgrade and subbase to check for unstable areas that should be undercut. The method, pattern and frequency will be determined by the Pavement Consultant.

L. Quality Assurance (QA): All activities that have to do with the Owner ensuring the quality of the product as specified, including materials sampling and testing, construction inspection, and review of Contractor quality control documentation. This work will be performed by the Pavement Consultant.

M. Quality Control (QC): All activities that have to do with the Contractor producing the quality of the product as specified, including training, materials sampling and testing, project oversight and documentation.

N. Rock Excavation:

1. Excavation of igneous, metamorphic or sedimentary rock or hardpan which cannot be excavated without continuous drilling or continuous use of a ripper or other special equipment.

2. Excavation of boulders of 1/2-cubic yard or more in volume.

O. SESC: Soil Erosion and Sedimentation Control as required in Division 01 "General Requirements – Temporary Facilities and Controls" and elsewhere in these Specifications.

P. Site Compacted Areas: Areas outside of the building line within the Contract limits.

Q. Structure: A building, retaining wall, tank, footing, slab or other similar construction.

R. Structure Backfill: Soil or other material which is placed against walls or sides of structures.

S. Subbase: Compacted fine and course aggregate layers used in the pavement between the subgrade and the pavement.

T. Subgrade: Compacted soil, either existing or provided as part of the Work, upon which new construction is to be installed.

U. Undercut: Excavation of native material from below the bottom of footings, floors, structures and subbases.

1.4 SUBMITTALS

A. Warranties: Submit written special warranty as specified in this Section. Include contact information, description of coverage, and start date for each special warranty.

1.5 SOIL EROSION AND SEDIMENTATION CONTROL

A. Prior to and during earthwork operations refer to Division 01 Section "General Requirements - Temporary Facilities and Controls" to ensure that provisions of that section are fulfilled.

1.6 BACKFILL COMPACTION TESTING

A. Contractor shall retain a licensed soils testing engineer, approved by the Owner, paid for as an allowance item, and shall submit to the Project Representative 3 copies of a report containing testing procedure, test results, and a statement that soil has been compacted in accordance with the specifications. The Project Representative shall give final approval of the backfill before construction continues. The following submittals shall be submitted directly to the Project Representative from the soils testing engineer, with one copy to the Contractor:

1. Test reports of borrow material.
2. Verification of each footing subbase.
3. Field density test reports.
4. One optimum moisture-maximum density curve for each type of soil.

B. Where more than one lift of soil is being placed, the soils testing engineer shall be present during the entire filling operation to confirm that each lift is properly compacted with approved soil.

C. Perform a maximum density test conforming to ASTM D1557 (Modified Proctor) for each type of soil encountered.

D. Field density tests shall conform to ASTM D2922 - Nuclear Method.

E. The frequency of testing shall be as follows:

1. Footing Subgrade: As required by Project Representative.

2. Paved Areas and Building Slab Subbase: One test per 2000 square feet for Subbase and one test per 1500 square feet per lift.

3. Footing and Trench Backfill: One test per 50 lineal feet per lift.

4. Trench Backfill: One test per 50 lineal feet per lift.

5. Post Backfill: One test per 12-inch lift (provided equipment is available).

6. Tree Stump Backfill: One test per 12-inch backfill lift (same as above).

F. Quality Assurance for Bituminous Pavement: the Pavement Consultant will perform QA of existing and installed material below the bituminous pavement. In order to perform that function, Contractor shall contact the Pavement Consultant 2 days prior to seperatly proof rolling the subgrade and subbase material, as well as keep the Pavement Consultant informed of the schedule of the installation of aggregates prior to paving. the Pavement Consultant will inform the Owner of deficient areas that have not been identified by Contractor as part of the Contractor’s quality control procedure. This inspection by the Pavement Consultant does not relieve Contractor of Contractor's responsibility to provide adequate quality control.

1.7 DESIGN AND PERFORMANCE REQUIREMENTS

A. Trench Bottom Suitability:

1. Contractor shall be responsible for the suitability of the normal trench bottom in supporting utility, bedding and backfill.

2. Contractor shall notify the Project Representative and await the Project Representative’s decision if a possible unsuitable condition exists.

3. NOTE: Poor dewatering techniques or lack of excess water control shall not be a reason for additional payment for remedial measures.

B. Trench Wall Stability:

1. Contractor shall be responsible for trench configuration, including sheeting, shoring and bracing necessary to support trench side walls from collapsing.

2. Contractor shall be responsible for structural design and stability of a pipe-laying box if utilized on the Project to prevent trench walls from collapsing.

C. Excavation Side Stability: Be responsible for structural design of sheet piling, underpinning, shoring and bracing to prevent sides of excavation from collapsing and causing damage to adjacent structures pavements and materials.

1.8 MATERIAL STORAGE

A. Stockpile satisfactory excavated materials in accordance with MDOT Standards where directed, until required for backfill or fill. Place grade, and shape stockpiles for proper drainage. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain. Place silt fence around stockpile, if left overnight.

1.9 WARRANTY

A. Failures of surface areas caused by settlement shall be repaired at Contractor's expense for a period of 3 years after completion of Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Materials: For backfill and fill, soils complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP. (Contractor shall note exceptions under Article 3.11 – Backfill and Fill.)

B. Unsatisfactory Soil Materials: For backfill and fill, soils complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

C. Granular Materials: In accordance with MDOT Sections 301, 302 and 902 for 22A aggregate, Class I, II and Class II Subbase materials, except no foundry sand is permitted. Granular material shall contain sufficient binder to provide fill capable of supporting construction equipment without displacement.

1. Sections 2.11 and 8.02 for Class II Subbase and shall meet or exceed a minimum permeability requirement (K) of 8 feet per day as determined by the Michigan Test Method (MTM) 122.

2. Quality control shall include a lab test prior to delivery and field testing each 1000 cubic yard delivered or fraction thereafter. Each test shall include taking 3 samples, testing them individually and averaging the results.

3. The Michigan Test Method (MTM) shall be used to determine acceptable material. Once tested and accepted, Contractor shall acquire the material from the identical location.

4. Contractor shall notify the Project Representative in advance of changing the source location.

5. Field permeability test samples shall only be taken after the material has been spread uniformly on the subgrade and before compaction takes place. Material shall be less than 90% saturated upon completion of the test.
6. Material that fails the test shall be replaced at no cost to the Owner, and the cost for failed tests shall be paid by Contractor.

D. Sand:

1. Fill Sand: MDOT Class II granular material that is free of clay.
2. Washed Sand: MDOT 2NS.

E. Lean Concrete: Mixture of Portland cement, aggregate and water having compressive strength of 2,000 psi at 28 days.

F. Granular Surface Materials: In accordance with MDOT specifications.

1. Gravel Drives: 22A aggregate modified to minimum 6% wash.

2. Limestone Drives: 21AA limestone aggregate.

3. Construction Tracking Mat: 6A crushed limestone.

4. Pavement Subbase: If not specified on Drawings, place thicknesses and materials as follows:

a. For concrete pavement, use 2-inch Class II sand compacted in place (CIP).

b. For bituminous pavement in roadways and loading docks with parking spaces, use 8-inch -21AA aggregate (CIP) over 12-inch Class II Subbase (CIP).

G. Topsoil

1. Topsoil (Owner-Provided & Contractor Placed):

a. Provided to Contractor from Owner stockpile or site stockpiled topsoil, or both, and approved by the Owner. Contractor is responsible for hauling and spreading the topsoil.

b. 6-inches total depth of screened topsoil with compaction of 80-85% maximum density to eliminate settling.

c. Owner shall direct Contractor as to which topsoil stockpile shall be used.

2.2 UTILITY SLEEVING

A. Schedule 80 PVC under roads.

B. Schedule 40 PVC under walks.

C. End caps as required.

2.3 SMART BALL

A. Product 1428-XR/1D purple; manufactured by 3M Dynatel. Michigan Representative: Gregware Equipment, Grand Rapids, Michigan; 1-800-248-5678.

1. Provided by Owner

B. Quantity:

1. One smart ball on pipe lengths 0 to 12 feet; with end cap at other end.
2. For pipe lengths over 12 feet, place one smart ball at each end of the sleeve.

PART 3 - EXECUTION

3.1 SOIL EROSION AND SEDIMENTATION CONTROL

A. Prior to and during earthwork operations, refer to Division 01 Section "General Requirements - Temporary Facilities and Controls" to ensure that provisions of that section are fulfilled.

3.2 PREPARATION

A. Plan the Work to minimize the time excavation remains open. If excavation remains open beyond the time approved in the Project schedule, additional requirements may be imposed at no additional cost to the Owner.

B. Adequately barricade the excavation at all times to protect workers and the public from the danger of the open excavation.

3.3 EXCAVATION FOR STRUCTURES

A. Excavations shall extend a sufficient distance from footings and foundations to permit placement and removal of concrete formwork, installation of services, other construction, and inspection. Care shall be taken not to disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive concrete.

B. Bracing and Sheeting:

1. Do not install by jetting.

2. Furnish, put in place and maintain sheeting, bracing and shoring, as may be required to properly support the sides of excavations and to prevent movement of earth which could in any way injure the Work or adjacent property.

3. Exercise care in removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of excavation faces being supported and damage to the Work and adjacent property.

4. Do not leave sheeting or bracing in the excavation after completion of the Work, unless approved by the Project Representative.

C. Undercut:

1. If suitable bearing for foundations is not encountered at elevations indicated on the Drawings, immediately notify the Project Representative.

2. If soft material, which in the opinion of the independent testing laboratory is not suitable, is encountered below a structure, the Project Representative may order removal of this soft material and its replacement with specified material in order to make a suitable foundation for construction of the structure.

3. Undercutting made at the order of the Project Representative will be paid for on the basis of the actual quantity of material excavated. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.

4. No extra payment will be made if removal is required as a result of poor dewatering techniques.

5. Undercutting, which is specifically indicated on the Drawings or herein specified, shall be included in the base bid.

6. Soil removed may be used as fill in areas not below driving surfaces, structures or utility structures.

7. Compact subgrade at bottom of undercut prior to placing fill.

8. Place and compact specified fill in undercut.

9. Lateral extent of undercut shall be a horizontal distance equal to the depth of undercut below structure.

D. Excavating:

1. Excavation shall be by open cut from the surface except as herein specified or as indicated on the Drawings.

2. Excavations for structures shall be made in such manner and to such depth and width as will give ample room for building the structures and for bracing, sheeting and supporting the side of the excavation, for pumping and draining groundwater and wastewater which may be encountered, and for removal of material excavated.

3. Excavate to required cross section and elevation indicated on the Drawings. Subgrade shall not vary more than 0.1 feet above or below the established elevations.
4. Depression caused by excess excavation, traffic or rolling shall be filled with MDOT 902 Granular Material Class II or approved fill and rerolled and compacted in place as specified herein.

5. If required because of excess water conditions, place stone stabilization course prior to proceeding with construction. Place filter fabric over stone stabilization course.

3.4 EXCAVATION FOR PAVEMENT

A. Cut surface under pavements to comply with cross-sections, elevations and grades as indicated on Drawings.

3.5 EXCAVATION FOR UTILITIES

A. Width of Trenches:

1. Steam Tunnels: Widths at bottom of trench shall be 3 feet wider than the overall width of tunnel or vault, and shall at all times be of sufficient width to permit tunnel and vaults to be built properly, waterproofed and backfilled.

2. Pipelines: Widths of trenches for pipe lines shall allow for proper compaction of the haunching. The trench width at the spring line of the pipe for pipes less than 48 inches shall be pipe width plus 18 inches. The trench width for pipes larger than 48 inches shall be the pipe diameter plus 30 inches.

3. Electric and Telephone Ducts: Trench shall be the proper width and depth for the duct bank, allowing a minimum of 3 inches of concrete on each side of the duct formation.

4. Street Light Cable: Minimum trench width shall be 6 inches, maximum width shall be 12 inches, and minimum depth shall be 30 inches.

B. Length of Trenches: Excavation shall be finished to the required grade for an adequate distance in advance of the completed installation. Unless otherwise permitted by the Project Representative, the amount of trench that shall be open in advance of the construction shall not exceed the following limits:

1. Steam Tunnels: Length between 2 vaults, minimum.
2. Buried Steam Systems: Length between 2 vaults, minimum.
3. Sewers: 50 lf.
4. Water Mains: 50 lf.
5. Electric and Telephone Ducts: The amount that can be encased in concrete in a day.
6. Street Light Cable: The amount of cable that can be laid in a day.

3.6 REMOVAL OF EXCESS SUBSOIL

A. Excess subsoil shall be removed from the Owner’s property and legally disposed.

3.7 UTILITIES TO BE ABANDONED

A. When pipes, conduits, sewers or utility structures are removed from the trench, leaving dead ends in the ground, fully plug such ends with brick and mortar.

B. Entirely remove abandoned utility structures unless otherwise specified or indicated on Drawings.

C. Remove materials which can be readily salvaged from the excavation and store on site as indicated on the Drawings.

D. Salvageable materials will remain the property of the Owner unless otherwise indicated on the Drawings.

3.8 UTILITY SLEEVING

A. Place sleeve as located on the Drawings. Maintain structural integrity of pipe.

B. Place Smart ball at end of pipe and fabric. Attach with duct tape to end of pipe. See PART 2 - PRODUCTS for quantities.

C. Place PVC cap on end of pipe when only one Smart ball is required.

3.9 BEDDING

A. Place bedding material up to 1/8 the height of the utility. Compact as herein specified.

B. Accurately shape bedding material to fit pipe shape. Recess bedding to relieve pressure on the bell or other projecting utility joint.

C. After laying out the utility, tamp additional bedding in place up to the midpoint of the utility. Use hand-operated compactors to achieve required compaction.

D. Place additional bedding up to 12 inches above top of utility. Use hand-operated compactors to achieve required compaction.

E. Place bedding in maximum lifts of 12 inches.

F. No payment shall be made for aggregate or stone bedding when used for Contractor convenience.

G. Provide concrete encasement at utilities as indicated on the Drawings.

3.10 SHEETING, SHORING AND BRACING EXCAVATIONS

A. General:

1. Furnish, put in place and maintain sheeting, bracing and shoring as may be required to properly support side of excavations and to prevent movement of earth, which could in any way injure the Work or adjacent property.

2. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of excavation faces being supported and damage to the Work or adjacent property.

3. A pipe-laying box may be used in lieu of sheeting.

B. Sheeting:

1. Do not install by jetting.

2. Remove as backfilling proceeds, unless ordered left in place by the Project Representative. Use care to fill and compact voids created by removal, especially below mid-height of utility.

3. Sheeting Left In Place:

   a. Required written approval of the Project Representative.
   b. Cut off minimum of 4 feet below finished grade.

3.11 BACKFILL AND FILL

A. General:

1. Commencement of Backfill Operations: Backfill excavations as promptly as work permits, but not until completion of the following:

   a. Acceptance by Project Representative of construction below finish grade including where applicable, dampproofing, waterproofing and perimeter insulation.

   b. Removal of trash and debris.

   c. Permanent or temporary horizontal bracing is in place on horizontally supported wall.

   d. Removal of concrete formwork.

   e. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities. Contractor shall leave shoring to be embedded in the backfill of the trench or other excavation, for the purpose of preventing injury to the completed structure or other adjacent structures or property. Ends of sheeting, bracing or timber left embedded in the backfill shall be cut off and removed at least 2 feet below the established grade.

2. Acceptable Backfill: Place specified soil material in layers to required subgrade elevations, up to, but not including subbase material, for each area classification listed below:

   a. In excavations, use approved excavated or borrow material, except as otherwise specified.

   b. Under grassed areas use satisfactory excavated materials, unsatisfactory excavated soil classification groups GC, SC, ML, and CL, or approved borrow material.

   c. Under pavement use satisfactory excavated Class II and Class II subbase granular material. Soil classification groups GC, SC, ML and CL may be used with the approval of the Project Representative.

   d. Under building slabs, use Class II granular material.

e. In utility trenches, use Class II granular material.

3. Required Concrete Within Backfill:

a. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.

b. For piping or conduit less than 2′-6″ inches below surface of roadways, provide 4-inch thick concrete base slab support. After installation and testing of piping or conduit, provide minimum 4-inch thick encasement (sides and top of concrete) prior to backfilling or placement of roadway subbase.

B. Ground Surface Preparation:

1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break-up sloped surfaces steeper than 1-foot vertical to 4 feet horizontal so that fill material will bond with existing surface.

2. Subsoil Preparation Prior to Topsoiling: This procedure is required to prevent permanent establishment of a dense layer of soil caused by construction operations, that would make it difficult for vigorous plant growth and proper drainage. In areas of the Project site that are compacted during construction, as determined by Project Representative, and after completion of exterior building construction operations, where vehicles/equipment would be required to travel across the soil around the structure or the constructed site improvements, or both, the existing subsoil, as well as the top 12 inches of newly placed subsoil, shall be loosened using the following procedures:

a. Prior to beginning this work, notify Project Representative at least 1 business day in advance. Also, re-stake existing and new utilities that may be disturbed by these earthwork operations.

b. The moisture content of existing and new soil shall be optimum for this earthwork operation. Each step shall be approved by the Project Representative, prior to continuing to the next step, and prior to satisfactory completion of the final step.

c. For areas where the existing subsoil grade is to remain and for areas which will receive additional soil:

1) STEP 1 – Loosening Existing Subsoil and Debris Removal: Existing subsoil shall be brought to a friable condition 12-inches deep, prior to placing additional subsoil fill. Possible equipment to use to loosen the soil include, but are not limited to, chisel plow, backhoe bucket, disc or harrow; followed by discing, if a disc is not initially used, to reduce the soil clump to the desired size. Contractor will submit a proposed method of loosening the subsoil to the Project Representative for approval at least 14 days prior to commencement of the work. The submittal shall include the method of equipment to be used. The soil shall be broken up sufficiently so that the resulting soil fragments are small. Also it is equally important to legally

dispose of construction debris and rocks larger than 27 cubic inches exposed during this process.

2) STEP 2 – Placing of Additional Subsoil Fill- Transitional Layer Blending: Where additional fill is required, place the initial "transitional" layer and blend with the existing subsoil utilizing methods mentioned in Step 1.

3) STEP 3 –Subsoil Fill - Top Layer Loosening: Loosen top layer to a friable condition, blending in the first 1"-2" of topsoil. If no additional subsoil is required, delete Step 2.

4) STEP 4 – Final Grading and Protection: Grade the disturbed area to the elevations as specified, in preparation for topsoil placement. Do not otherwise recompact the subsoil. Once the subgrade is approved, construction equipment and vehicles unrelated to topsoiling and planting operations shall be prohibited. (Contractor may be required to provide temporary construction fencing to prevent recompaction of the subsoils. Costs for temporary fencing is a Contractor expense.)

d. For areas where existing subgrade is to be lowered:

1) STEP 1 – Existing Subsoil Excavation and Debris Removal: Excavate the subsoil, removing all excess material from the site to the proposed subgrade. Remove and legally dispose of construction debris exposed during this process.

2) STEP 2 – Subsoil Loosening: Existing subsoil shall be brought to a friable condition 12-inches deep. Possible equipment to use to loosen the soil include, but are not limited to, chisel plow, backhoe bucket, disc or harrow; followed by discing, if a disc is not initially used, to reduce the soil clump to the desired size. The resulting soil shall be broken up sufficiently so that the resulting soil fragments are small.

3) STEP 3 – Final Grading and Protection: Grade the disturbed area, as specified, in preparation for topsoil placement. Do not otherwise recompact the subsoil. Once the subgrade is approved, construction equipment and vehicles, unrelated to topsoiling and planting operations, shall be prohibited. (Contractor may be required to provide temporary construction fencing to prevent recompaction of the subsoils. Costs for temporary fencing is a Contractor expense.)

3. Subsoil Preparation for Paved Areas:

a. If, after rough grade has been achieved in cut areas and prior to placement of fill material in fill areas, the exposed subgrade has a density less than that specified under Article 3.12 – Compaction for particular area classification, break-up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density. Entire area shall be proof rolled with a heavy rubber-tired vehicle, such as a loaded scraper or loaded dump

truck, to locate areas of extreme pumping and yielding, which shall be repaired as follows:

1) Soft areas due to moisture laden soil shall be corrected by applying an appropriate soil stabilization procedure to be specified, or as directed by Project Representative.

2) If required density cannot be obtained, the objectionable material shall be removed and replaced as ordered by the Project Representative.

3) The cost of corrective measures incurred as a result of stabilizing poor subgrade conditions shall be paid on basis of contract conditions relative to changes in work.

C. Placement and Compaction:

1. No backfill shall be placed without it being compacted in place. Backfill material shall be compacted in layers not exceeding 6 inches in compacted thickness.

   a. Granular, non-cohesive soils shall be compacted with mechanical tamping or vibration-type compactors. Sand may be compacted by flooding the trench when water is available.

   b. When clays are encountered, a mechanical tamper or sheeps-foot roller shall be used to compact the soil. Manual mechanical tamping equipment shall have a rammer which weighs not less than 20 pounds and has surface area of not more than 36 square inches. Hand compaction is not acceptable.

2. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.

3. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift.

4. Existing Utilities: Where existing utilities are required to be tunneled under, the area under the utility shall be filled with compacted sand, and have the pipe embedment reconstructed as for new piping.

5. Pipe Embedment: New piping shall be laid on a sand leveling bed compacted to maximum thickness of 6 inches. Dig holes in bedding for bells and fittings so pipe bears uniformly along its length. Hand compact the haunching under the spring line of the pipe. Take extra care to control the density of the haunching on plastic pipe in accordance with the manufacturer's instructions.

3.12 COMPACTION

A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification. Perform all required tests.

B. Moisture Control:

1. Where soil material must be moisture conditioned before compaction, uniformly apply water to surface of subbase, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

C. Required Densities:

1. Structures, Building Slabs and Steps: Compact top 18 inches of subgrade and each layer of backfill or fill material to 95% of maximum density or greater.

2. Pavements: Compact disturbed soil to remain and subbase material to 95% maximum density or greater.

3. Lawn or Unpaved Areas: 80-85% maximum density, Refer to Article 3.11.B.

4. Trench Backfill: Compact layers 6 inches or less to 95% maximum density or greater.

5. Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material to 95% maximum density or greater.

6. Fill Under Existing Utilities: Compact top 6 inches of subgrade and each layer of backfill to 95% maximum density or greater.

7. Sand Pipe Bedding: Compact top 6 inches of subgrade and 6-inch layer of sand to 95% maximum density or greater.

3.13 FINISH GRADING

A. Finish surfaces free from irregular surface changes, and as follows:

1. Lawn or Unpaved Areas: Finish topsoil to within not more than 0.10 feet above or below specified finish grade as measured after settlement and/or specified compaction is attained

2. Pavements: Shape surface of areas under pavement to line, grade and cross section, with finish surface not more than ¾ of an inch above or below required subgrade elevation.

3. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within tolerance of 2 inches when tested with a 10 foot straightedge.

B. After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

C. Proof Roll: Contractor shall arrange with the Pavement Consultant to approve subgrade as indicated in Articles 3.11 and 3.12.

3.14 PAVEMENT SUBBASE COURSE

A. Grade Control: During construction, maintain lines and grades including crown/cross-slope of subbase course.

B. Placing: Place subbase course material on prepared subgrade in layers of uniform thickness of 6 inches or less, conforming to indicated cross section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

C. Class II subbase shall be spread and compacted identical to regular Class II material.

D. Proof-roll before placing the bituminous pavement.

3.15 GRANULAR SURFACE COURSE

A. Grade Control: During construction, maintain lines and grades including cross-slope of subbase course.

B. Placing: Place granular course material (22A gravel for parking areas and 21AA for roadways and loading docks) on prepared subbase in a layer of uniform thickness, as indicated on the Drawings for cross section and thickness.

3.16 BUILDING SLAB SUBBASE

A. Place subbase material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.

B. Compact subbase in maximum 6-inch lifts.

3.17 TOPSOIL OPERATIONS (SUBSOIL SURFACE PREPARATION, HAULING, SPREADING, ROUGH GRADING AND CLEAN-UP)

A. Project Representative shall approve rough grade elevations of existing subsoil prior to commencement of subsoil loosening operations.

B. Once loosening of subsoil has been completed, the Project Representative shall approve prior to topsoiling.

C. Topsoiling operation shall be complete before October 31, unless approved by the Project Representative.

D. Topsoil shall be placed by an approved topsoil installation contractor.

E. Contractor shall submit a proposed method for placement of topsoil to the Project Representative for approval at least 14 days prior to commencement of the Work. The submittal shall include equipment to be used.

Owner will identify topsoil stockpile for use. The contractor will be responsible for hauling and spreading the topsoil. Stockpile storage site is open from 6 a.m. to 4:30 p.m., unless other times are arranged with Project Representative and MSU Landscape Services Department.

F. Topsoil shall be placed in quantities appropriate to result in 6 inches of depth when compacted to 80-85% maximum density, spread to minimize uneven compaction, and placed as follows:

1. Place 6 inches of screened topsoil over loosened subgrade blending first 1”-2” into the subgrade. Obtain approval of subgrade from Project Representative prior to placement of topsoil (review Article 3.11 B Ground Surface Preparation for requirements and procedures).

G. Place silt fence at locations designated on the Contract Documents and locations specified by the Project Representative prior to topsoil placement. Silt fence shall become property of Owner and removed by Owner.

H. Notify the Project Representative when topsoiling is complete for final inspection, approval and Owner seeding of site.

3.18 INSPECTION

A. Contractor shall notify the Project Representative when the excavation is complete. A visual subgrade inspection shall be performed prior to placing reinforcing steel, concrete, pipe beddings, etc. If satisfactory soil conditions are not found at the depths indicated, immediately notify the Project Representative in writing before proceeding further. Should Contractor fail to notify the Project Representative, all settlement and damage caused by new work resting on soft or unsound earth shall be made good at the sole expense of the Contractor.

3.19 PROTECTION

A. Protect newly graded areas from traffic and erosion. Keep free of trash, debris and plant material, including weeds and grass.

B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances. Where settling is measurable or observable at excavated areas during Project warranty period, remove pavement, lawn or other finish, add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

C. Where completed compacted areas are disturbed beyond specified tolerances by subsequent construction operations or adverse weather, scarify, reshape, and restore surface to match surface of originally installed work. Eliminate evidence of the repair to the greatest extent possible.

D. Continue to properly maintain soil erosion and sedimentation control measures. Perform and document required site inspections until the Owner has officially accepted the Project site.

3.20 CLEAN-UP

A. Refer to Division 01 Section "General Requirements - Temporary Facilities and Controls."

B. The Contractor shall perform daily maintenance and cleanup of construction materials and debris tracked on and off site. Materials and debris that accumulate and are not removed or maintained after a 24-hour notification of a violation by the Owner, will be separately contracted by the Owner and all associated costs will be charged to the Contractor.

END OF SECTION 312300

SECTION 312319 – DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes dewatering.

C. Related section includes Division 01 Section “General Requirements - Temporary Facilities and Controls.”

PART 2 - PRODUCTS

2.1 DEWATERING BAG

A. Dirtbag brand dewatering bag manufactured by ACF Environmental, 800-644-9223, www.acfenvironmental.com; or equal.

PART 3 - EXECUTION

3.1 DEWATERING

A. Contractor shall remove by pumping, bailing, or other acceptable methods, water which accumulates in trenches and other excavations made under this Contract, and shall take necessary precautions to keep the trenches and other excavations entirely clear of water.

B. During freezing conditions, water discharge onto paved areas shall only occur if approved provisions are taken to protect public safety.

C. Soil Erosion and Sedimentation Control: Water pumped from excavations, low areas or other site situations shall meet soil erosion and sedimentation control requirements and restrictions. Refer to Division 01 Section “General Requirements - Temporary Facilities and Controls” for specific information.

3.2 WATER DISPOSAL

A. Pumped storm water shall pass through an approved pumped sediment removal system, prior to water leaving the construction site. Sediment removal system shall meet or exceed SESC requirements. At all times, the system shall be cleaned and replaced, if necessary, to maintain its maximum efficiency.

B. Water shall not be pumped into sanitary sewers.

C. Where existing storm sewers are encountered in the construction of the Work, Contractor shall make adequate provision for diverting the flow of the existing storm sewers, so as to keep the Work entirely dry during construction.

D. At all times, Contractor shall have sufficient pumping equipment and sediment filter equipment ready for immediate use to carry out the intent of this section.

END OF SECTION 312319

SECTION 314100 – SHORING AND UNDERPINNING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes shoring and underpinning of utilities, structures and property.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials utilized shall be as selected by Contractor.

PART 3 - EXECUTION

3.1 SHORING AND UNDERPINNING

A. Contractor shall design, furnish, install, and maintain sheeting, bracing, and shoring required to properly support the sides of excavation and to prevent movement of earth which could in any way damage the work under construction, existing utilities and structures, and adjacent property.

B. If the Project Representative is of the opinion that sufficient or proper supports have not been provided at any point, additional supports may be ordered, at the expense of the Contractor. Neither the placing of such additional supports by the order of the Project Representative nor the failure of the Project Representative to order such additional supports placed shall release the Contractor from the responsibility of the adequacy of such supports and the integrity of the Work.

C. In the removing of sheeting and bracing, special care shall be taken to prevent caving of the sides of the excavation and damage to the completed work or adjacent property.

END OF SECTION 314100

SECTION 314200 – OUTFALL ANCHORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes anchoring of utilities, structures and property.

1.3 DESCRIPTION

A. This work shall consist of constructing Percussive Driven Earth Anchor (PDEA) tie back precast outlet headwalls at the locations shown on the plans. The work shall include installation of outlet headwall and any excavation required of the shoreline/bank to required profile and elevations in accordance with approved Contractor's plans, installation materials, installation of PDEA, load locking anchors, providing and installing the specified drainage features, providing and installing bearing plates, beveled washers and load nut, and other required miscellaneous materials. The contractor shall select the excavation, installation, and methods to meet the performance requirements specified herein or as shown on the plans.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Anchor Head – Platipus B6 or Equivanlent.
   1. Percussion anchors shall be made of corrosion resistant galvanized spheroidal graphite iron, gravity die cast and heat treated to give considerable increase in mechanical strength and durability both during installation and in service.
   2. The anchor head and all connections or components that make up the anchor head assembly shall be Hot Dipped Galvanized in accordance to ASTM A-123. Connections shall be internally machined to accept the appropriate specified threaded rod, which shall also be hot dipped galvanized (ASTM A-123) for permanent applications.
   3. Anchor Head Dimensions:
      a. Length: 13.2"
      b. Width: 8.1"
      c. Bearing Area: 71.3 in^2

B. Tendon Solid Bar.
   1. #7 Grade 75.
   2. ASTM A615 All Thread Bar shall be made of cold rolled continuous, rounded course thread, it shall be hot dipped galvanized in accordance with ASTM A-123.
   3. Approx. Thread Major Diameter: 1"

C. Rod Coupling.

1. Coupling Connection– Stop Type Coupling, Hot Dipped Galvanized(ASTM A-123) Cast Iron tapped to accept #7 Grade 75 cold rolled rounded course thread bar.
2. Bar design & Nominal Dia.: #7 – 7/8" (22mm)
3. Outside Dia.: 1-3/8" (35mm)
4. Overall Length: 4" (102mm)

D. Rod Termination.
1. T-Knuckle- Clevis Connection– Hot Dipped Galvanized (ASTM A-123) Cast Iron tapped to accept #7 Grade 75 cold rolled rounded course thread bar.

E. Load Plate.
1. load plate shall be hot dipped galvanized (ASTM A-123).
2. Minimum dimensions: (6" x 6" x ½")

F. Tie Back Termination.
1. Flat Washer. 1-1/6" Diameter Opening. Hot dipped Galvanized.
2. Bolt. 1" Diameter. Hot Dipped Galvanized.

2.2 MANUFACTURER

A. Platipus Anchors Inc., 1325 Express Drive, Raleigh, NC 27603. (919) 662-0991. civils@platipus.us

PART 3 - EXECUTION

3.1 OUTLET ANCHORING

A. Anchor Installation.
1. Use anchor installation equipment specific to the anchor manufacturer and necessary to install, and with sufficient capacity to penetrate earth materials and develop the specified working and/or proof load(s). Install as shown in the construction documents.
2. Install load plate(s) and lock off termination assemblies (washers (beveled or flat) and load nut) prior to attachment of load locking tools. Load each anchor to the specified working load, and proof load select anchors as directed by design and plan documents or as directed by the engineer
3. Installation Manual: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://resources.platipus-hub.com/Brochures/UK/Platipus%20Civil%20Engineering%20&%20Construction%20Brochure.pdf

END OF SECTION 314200

PLATIPUS
EARTH ANCHORING SYSTEMS

Civil Engineering & Construction

Brochure

INTRODUCTION

Platipus® Anchors Limited are market leaders in the design, manufacture and supply of mechanical earth anchoring products in the UK. Founded in 1983, we are renowned for providing some of the most innovative and cost effective anchoring solutions for the Civil Engineering and Construction industries.

The percussion driven mechanical anchor is a unique, modern and versatile device that can be rapidly deployed in most displaceable ground conditions. It offers a lightweight corrosion resistant anchor that can be driven from ground level using conventional portable equipment. It creates minimal disturbance of the soil during installation, can be stressed to an exact holding capacity and made fully operational immediately. As a completely dry system it also has minimal environmental impact.

Applications

- Retaining Walls
- Slope Stabilisation
- Bridges
- Sheet Piling
- Erosion Control
- Gabion Support
- Rock Retention
- Buoyancy Control/ Pipelines
- Drainage
- Guyed Structures
- Scaffolding
- Foundations
- Landfill Capping
- Portable Buildings/ Structures
- General Security
- Marine Applications
- Tunnel Linings
- Temporary Works

FEATURES & BENEFITS

KEY BENEFITS OF THE PLATIPUS® EARTH ANCHORING SYSTEM

- Simple and effective concept
- Lightweight corrosion resistant products to suit a range of design life requirements
- Fast and easy installation
- Immediate quantifiable loads
- Holding capacity up to 200kN
- Ideal for temporary and permanent situations
- Cost effective alternative to traditional anchoring techniques

ENVIRONMENTAL BENEFITS

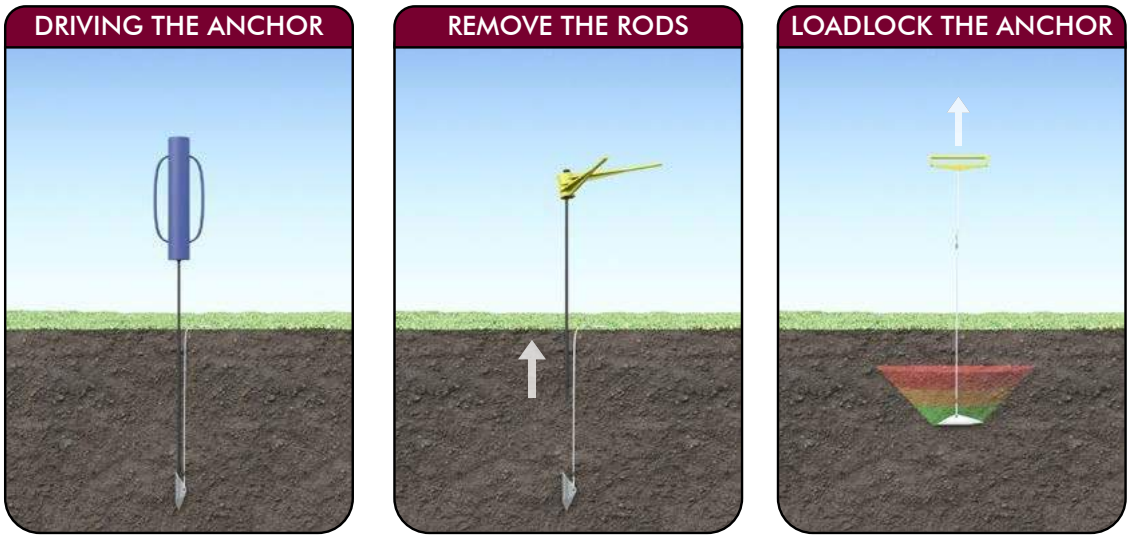
- No grout
  - No curing time
  - No mess
  - No contamination
- Low environmental impact
- Can be suitable for Special Areas of Conservation (SAC's)

ADDITIONAL SERVICES & PRODUCTS

- Design assistance including full indemnification
- Technical presentations
- Site surveys and anchor testing
- On-site training and demonstration
- Supply and installation service through a network of Approved Installers
- Large choice of hire equipment to install and proof test the system
- Latest information accessible to download from our website www.platipus-anchors.com
- Anchor specification software and additional information is available online
- Plati-Drain® - a unique solution to reduce pore water pressure within clay slopes and from behind retaining walls
- Platipus® Anchored Reinforced Grid Solutions (ARGS®) - a low impact solution for surface erosion and shallow seated slip failures

HOW A MECHANICAL ANCHOR WORKS

There are three steps to the installation of an anchor system:



The same three basic steps apply to the installation of all anchor systems, from the smallest S2 to the largest B10.

STRESS DISTRIBUTION & BEARING CAPACITY

Granular Soil
(Based on Terzaghi's calculation)

Soft Cohesive Soil
(Based on Terzaghi's calculation)

The stress distribution in front of a loaded anchor can be modelled using foundation theory. The ultimate performance of an anchor within the soil is defined by the load at which the stress concentration immediately in front of the anchor exceeds the bearing capacity of the soil.

Factors that will affect the ultimate performance of the anchor include:

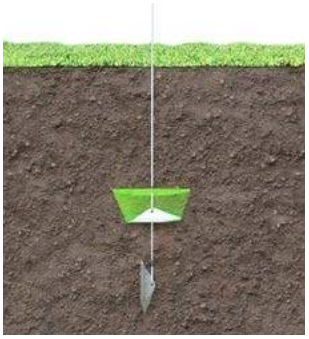
- Shear angle of the soil
- Size of the anchor
- Depth of installation

Platipus® anchors perform exceptionally well in a granular soil, displaying short loadlock and extension characteristics, a broad frustum of soil immediately in front of the anchor and extremely high loads.

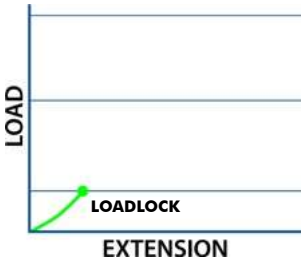
Stiff cohesive soils, such as boulder clays, can also give outstanding results. However, weaker cohesive soils, like soft alluvial clays, can result in long loadlock and extension distances and a small frustum of soil in front of the anchor. Consequently these conditions require a larger size of anchor and if possible a deeper driven depth to achieve design loads.

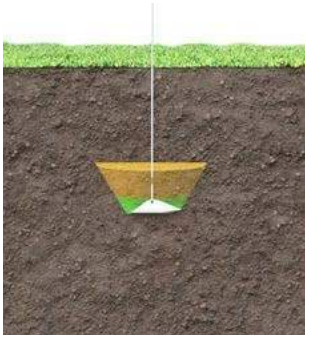
For further information please see the Anchor Load Indicator section on our website.

TYPICAL ANCHOR BEHAVIOUR

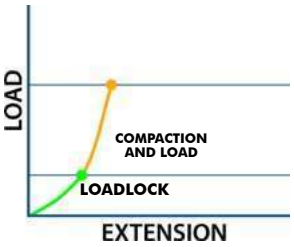


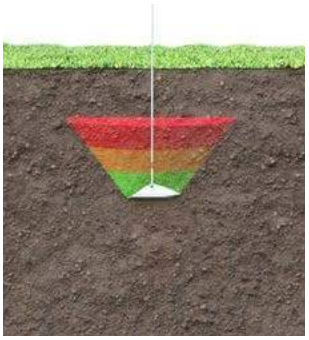
LOADLOCK
The first stage is where a load is applied to rotate the anchor into its loadlocked position. Elements of both load and extension are present.



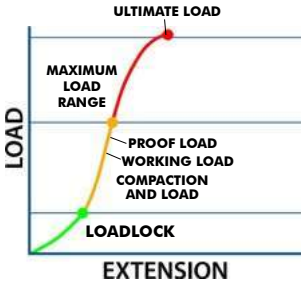


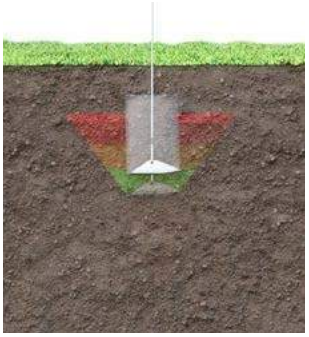
COMPACTION AND LOAD
The second stage is where the anchor system is generating a frustum of soil immediately in front of the anchor. At this point load normally increases with minimum extension. The soil type will affect the overall extension.



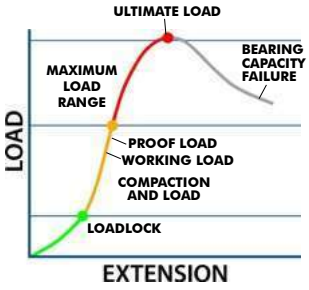


MAXIMUM LOAD RANGE
The third stage is where the anchor produces its ultimate load. As the anchor load approaches the bearing capacity of the soil, the rate of increase in load will reduce until bearing capacity failure of the soil takes place.



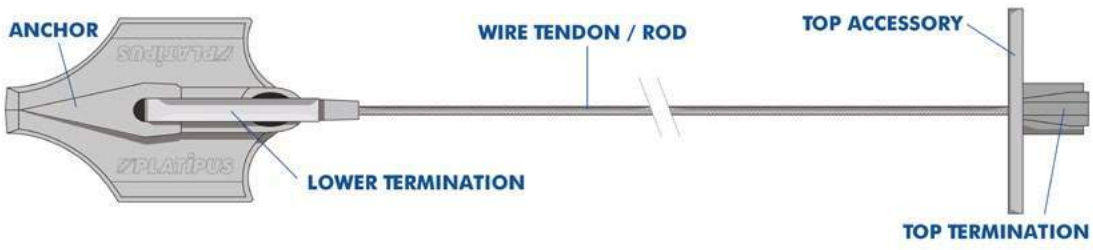


BEARING CAPACITY FAILURE
Caution: If the mechanical shear strength of the soil is exceeded, the residual load will decrease with continued extension as the anchor shears through the ground.



ANCHOR COMPONENTS

There are five components that make up an anchor system:



STEALTH ANCHOR

The 'Stealth' anchor is designed to cover a wide range of lightweight anchoring. Its narrow profile means that it requires a single core hole to drive through a stone or masonry wall.

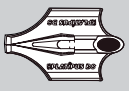
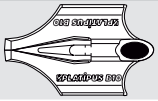
Its chisel drive point and streamline shape makes installation easy, in most cases, using simple hand or power tools. This also makes it an ideal choice when working in areas with restricted access.

Product Code	E=Eye Version	Dimensions L x W x H	Materials	Typical Load Range*	Minimum Driven Depth
S2		80 x 28 x 25	Aluminium Alloy; Hard Anodised Aluminium Alloy	0 - 2.5 kN	0.4 - 0.6m
S4		121 x 41 x 34	Aluminium Alloy; Hard Anodised Aluminium Alloy	1 - 10 kN	0.6 - 0.75m
S6		171 x 58 x 50	Aluminium Alloy; Hard Anodised Aluminium Alloy	5 - 25 kN	0.8 - 1.2m
			Galvanised Spheroidal Graphite Iron; Aluminium Bronze	5 - 50 kN	1.2 - 1.5m
S8		263 x 90 x 76	Aluminium Alloy; Hard Anodised Aluminium Alloy	10 - 40 kN	1.1 - 1.5m
			Galvanised Spheroidal Graphite Iron; Aluminium Bronze	10 - 70 kN	1.5 - 2.0m

BAT ANCHOR

The 'Bat' anchor is designed to achieve higher loads and also enhance anchoring in soft cohesive soils. Its ability to accept the T-Loc lower termination allows flexibility with regard to on-site anchor system assembly. It also means it can accept a wide range of wire tendons and solid rods.

Installation requires more powerful hand held hydraulic breakers or, in some cases, a wheeled or tracked excavator with a percussive breaker attachment.

Product Code	T=T-LOC Version	Dimensions L x W x H	Materials	Typical Load Range*	Minimum Driven Depth
B4		310 x 110 x 93	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	20 - 100+ kN	1.5 - 2.5m
B6		336 x 206 x 91	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	30 - 120+ kN	2 - 3m
B8		423 x 259 x 105	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	50 - 150+ kN	3 - 4m
B10		541 x 335 x 110	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	75 - 200 kN	4 - 5m

*The typical load range of an anchor is dependant on the engineering properties of the soil. The size of rod / tendon will also affect the load range

WIRE TENDONS & SOLID RODS

To suit most specifications and load requirements we can offer a wide selection of wire tendons and solid rods. Whether it is round strand wire tendon for applications requiring lower loads, the flexibility of wire tendons make it possible to work in areas where access and space is restricted.

We can also supply high yield solid rods which have a number of advantages over wire tendon. They can provide a higher ultimate load, sacrificial corrosion resistance and allow the depth of installation to be varied on-site.

Both wire tendons and rods are available in a range of sizes and materials to suit temporary (up to 5 year) through to permanent (120 year) design life.

TOP FITTINGS

We can provide a wide range of top fittings to suit most applications and budgets.

A load bearing plate and wedge grip is a perfect low cost solution for installations that are perpendicular to an application. Tilt washers are also available for angled installations. If the finished appearance is of aesthetic importance we offer a near flush fitting load plate that accepts a recessed wedge grip and cap or an inverted pattress plate which includes a hemispherical washer to allow the angle of anchor installation to vary between 0°-30°.

Top fittings specifically designed for revetment blocks and reinforced geomesh are available. We can also provide a variety of soft and hard eye terminations to secure guyed structures and scaffolding.

Over the last 30 years we have developed a large choice of top fittings. If you have a specific requirement that is not covered by our standard range we can supply a custom made solution.





Some applications, such as historical structures, require all evidence of anchoring to be concealed. This can be achieved by recessing the anchor system top fittings within the structure. Once complete the facing brick or stonework can be replaced to provide an invisible repair.

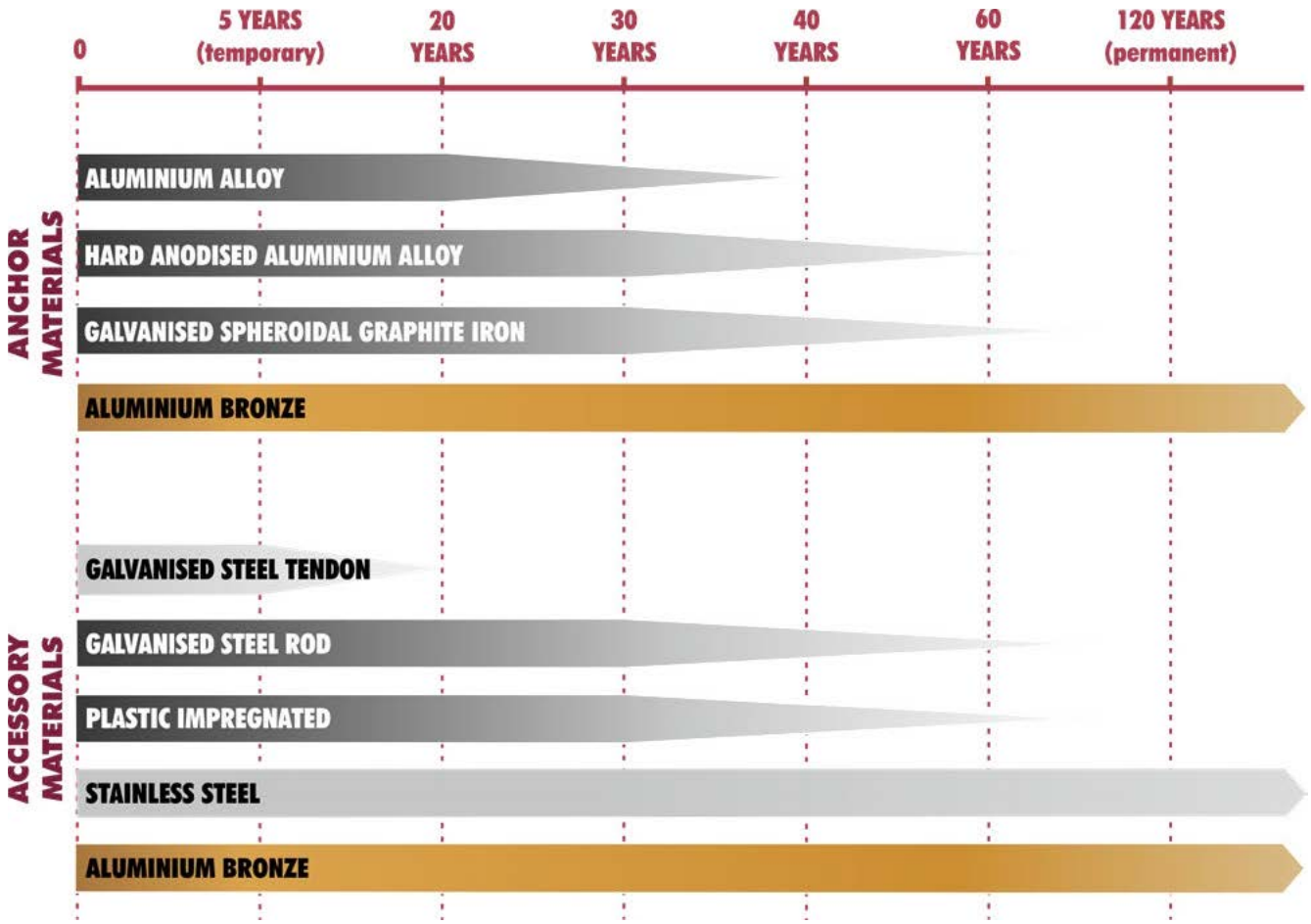


STRUCTURAL REINFORCEMENT

The Platipus® anchor system can also be used in conjunction with other structural reinforcement products to provide an extremely effective solution on masonry walls with limited structural integrity.

DESIGN LIFE

All anchor system components are available in a range of materials to suit the design life.
The selection of the project materials should be carefully chosen taking our advice for each individual project. The life expectancy of the anchor / tendon is dependant upon the corrosivity of the soil in which it is placed.



OTHER PRODUCTS

Water saturation, due to heavy rainfall and insufficient drainage, leads to the softening of clay soils within slopes and increases hydraulic forces behind earth retaining structures.

Plati-Drain® is a unique solution that reduces pore water pressure within clay slopes and behind retaining walls. Unlike conventional weep holes Plati-Drain provides deep penetration, this can be in excess of 10 metres. It can also help prevent shallow or deep seated slope failures.

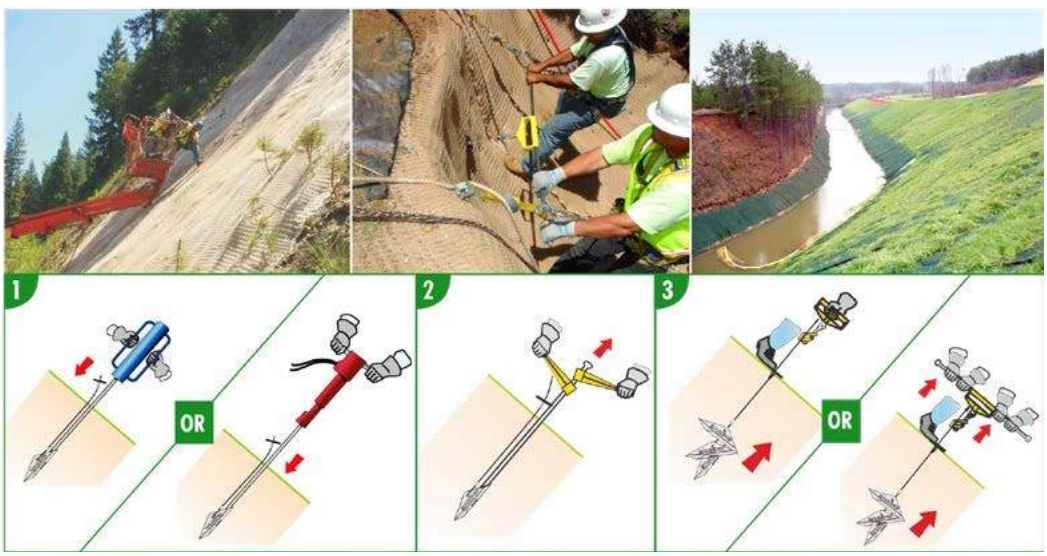
Available as a 'Passive' or 'Active' solution. The 'Passive' system uses a sacrificial anchor head to drive the Plati-Drain® into its optimum position providing an immediate channel for water to drain. The 'Active' system has an additional wire tendon attached to the anchor which allows it to be loadlocked, providing simultaneous draining and restraining capability.



The Platipus® Anchored Reinforced Grid Solution(ARGS®) is a perfect low impact anchoring solution for surface erosion problems and shallow seated slide failures. These lightweight systems can be used with most geosynthetic products including erosion control matting, membranes, geogrids, reinforced mesh, high density polyethylene coverings and cellular confinement systems.

Our S2, S4 and S6 Percussive Driven Earth Anchors (PDEA's®) are particularly effective in situations where access is difficult, where scour protection is required for example flood prone areas, riverbanks and storm water channels. Benefits of the system include its speed and simplicity, in most cases requiring only hand held equipment for installation. The system provides immediate load bearing capability and when combined with geosynthetic products and an appropriate range of plant types it can retain the slopes surface integrity. Our solutions can incorporate products from all major manufacturers to provide the best complete solution.

Please refer to our Platipus Anchored Reinforced Grid Solutions Brochure for more information or alternatively download this brochure from our website at www.platipus-anchors.com.



SITE ANALYSIS & LOAD REPORT

With the correct soil information we are able to predict holding capacities of our earth anchors. In circumstances where soil information is not readily available we recommend that a site analysis and load test report is completed.

The information recorded on this report will create an accurate picture of the site's condition and the exact capabilities of the anchor system. It will also identify other important considerations such as accessibility and installation times.

DESIGN ASSISTANCE

As part of our commitment to offer a complete package for clients, a full Indemnified Design service is available through our Geotechnical Consultant. These comprehensive designs are covered by Professional Indemnity Insurance.

A typical Indemnified Design will provide a calculation of earth pressures, prevailing and proposed factors of safety and specific earth anchoring system proposals.

APPROVED INSTALLERS

We have an excellent relationship with a network of Platipus® trained 'Approved Installers' throughout the UK. We work with these companies to provide our clients with a complete design, supply and installation service.

We can introduce you to the most suitable 'Approved Installer' who will be pleased to provide you with a competitive quotation for installation.

ON-SITE INSTRUCTION & SUPERVISION

We place great emphasis on customer training and product support. To achieve this, we offer a range of comprehensive training programmes for clients and distributors.

To satisfy individual requirements and for your convenience, we can also offer tailor made training and full product demonstrations on-site.

RESEARCH & DEVELOPMENT

Platipus® works at the leading edge of ground anchoring and to remain market leaders involves continuous development in product innovation and design.

New and unique applications for our products are constantly being identified. Working closely with customers, distributors and our Regional Managers new system designs are continually being launched into the market.

TECHNICAL PRESENTATIONS

We understand the importance of Continued Professional Development. Our philosophy is to offer busy professionals the opportunity to discover the advantages of the Platipus® earth anchoring system through comprehensive technical presentations, at a time and location convenient to you. This may take the form of a focused 1 to 1 introduction to our products or more formal presentation to a larger group.

If you would like a technical presentation please contact us to arrange a suitable date and time.

PLATIPUS ONLINE

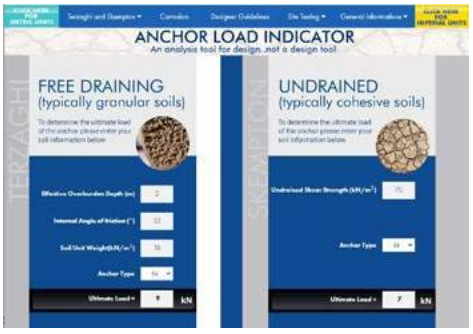
The Platipus® website is a quick and easy way to access the latest information. It contains over one hundred pages of product information, brochures, case studies, installation instructions and other technical documents. All are available to print or download.

Visit: **www.platipus-anchors.com**

ANCHOR LOAD INDICATOR

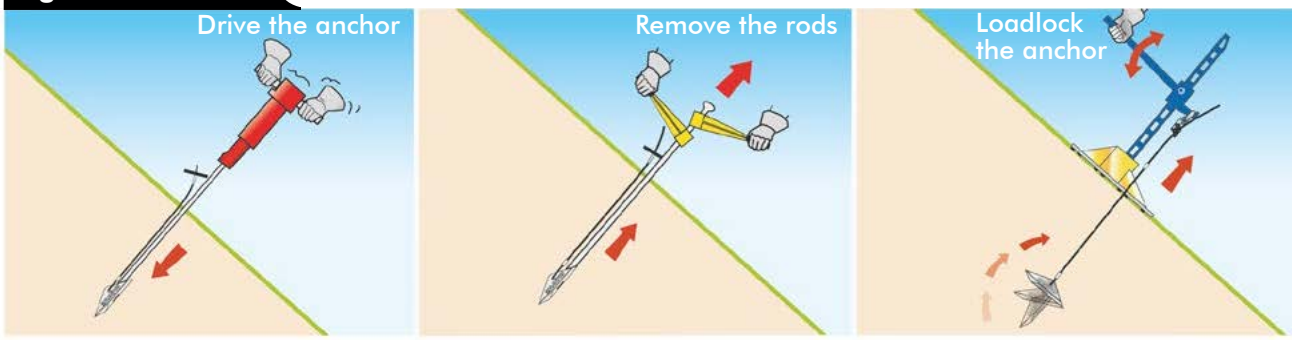
We are committed to providing our customers with effective products and solutions, together with unrivalled service and support. As part of this commitment, we can offer anchor specification software and additional technical assistance online.

Located on the Platipus® website this area has been specifically developed for Civil and Geotechnical Engineers with experience in foundation design. If you are working on a project that requires ground anchors and would like access to this area of our website please register online.

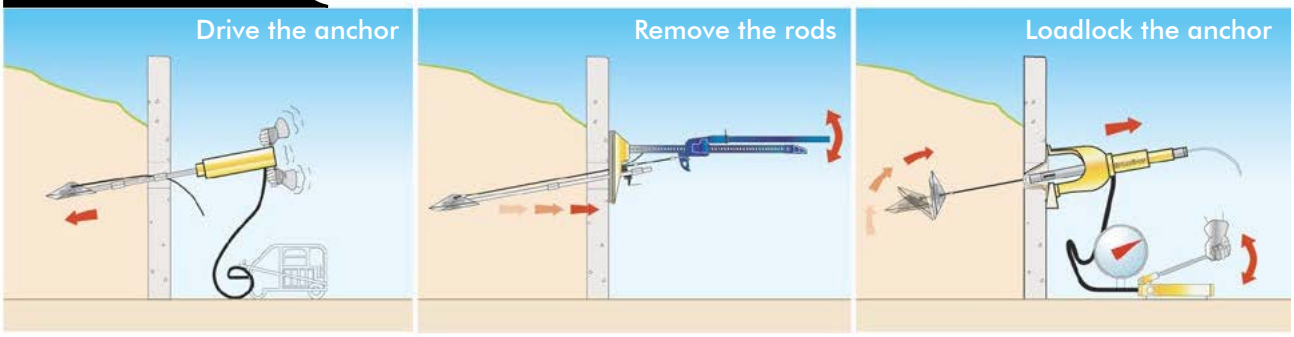


INSTALLATION EQUIPMENT

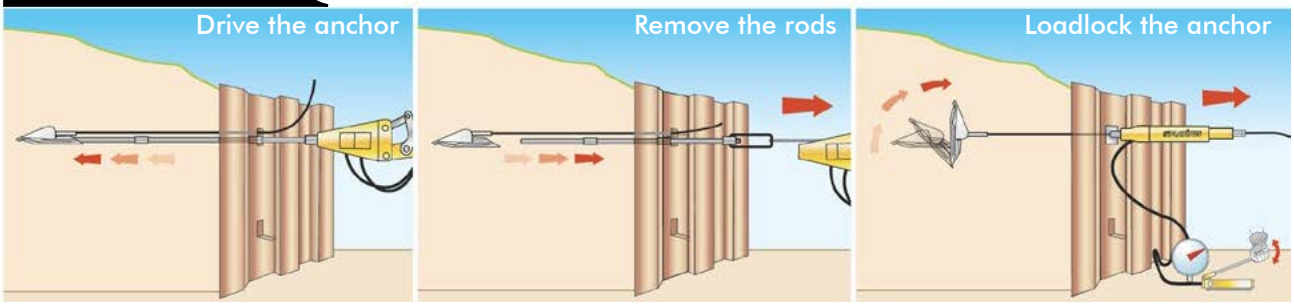
Light Installation



Medium Installation



Heavy Installation



HIRE EQUIPMENT

Although all installation equipment and tools are available to purchase, we understand that some customers may only require equipment for one-off installations. As a result, we can provide a large choice of hire equipment to install and proof test the complete range of earth anchors.

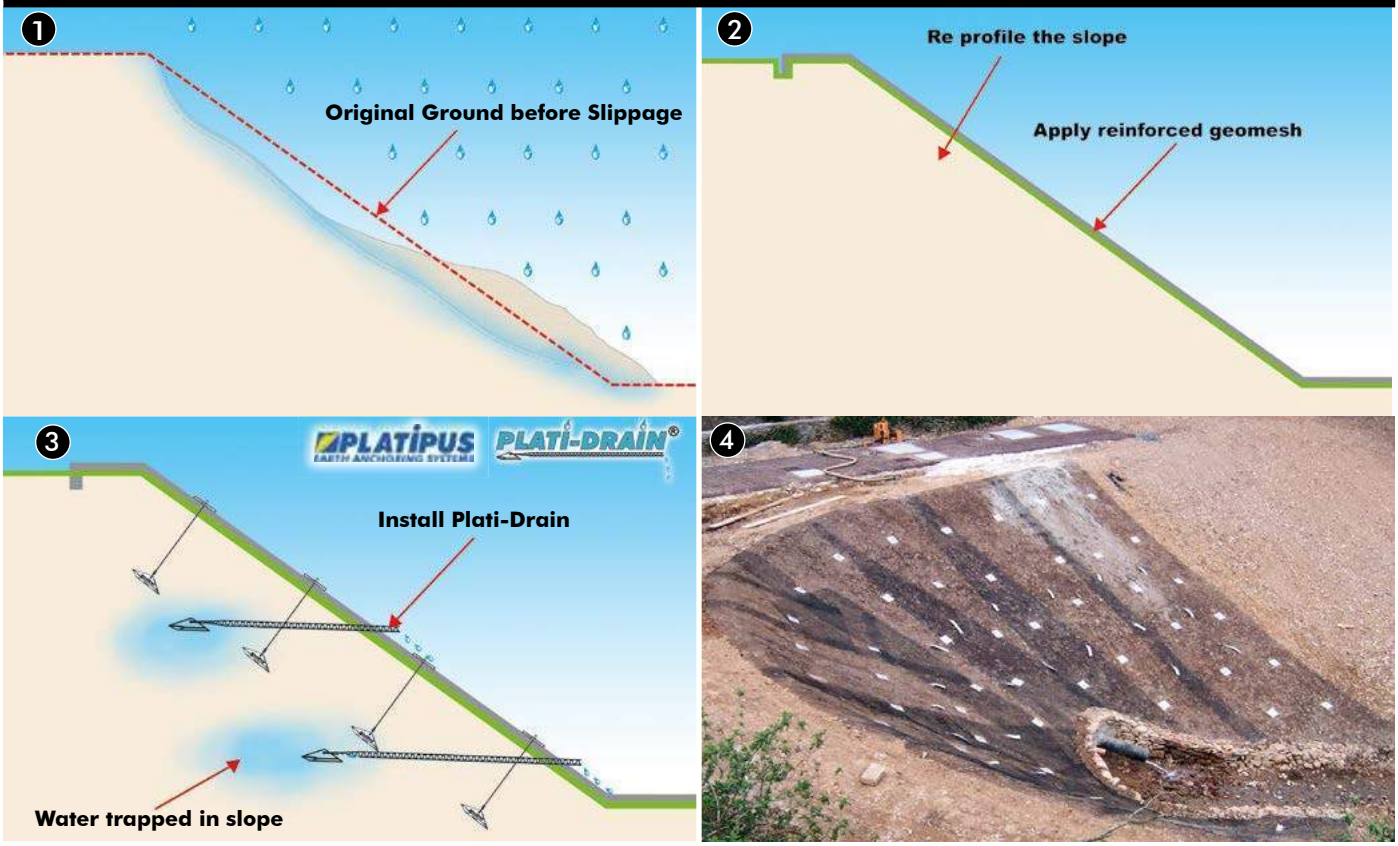
We purchase all of our equipment and tools from the market's leading manufacturers. Our hand-held hydraulic breakers and power packs deliver the lowest vibration and noise levels available.

CORE APPLICATIONS

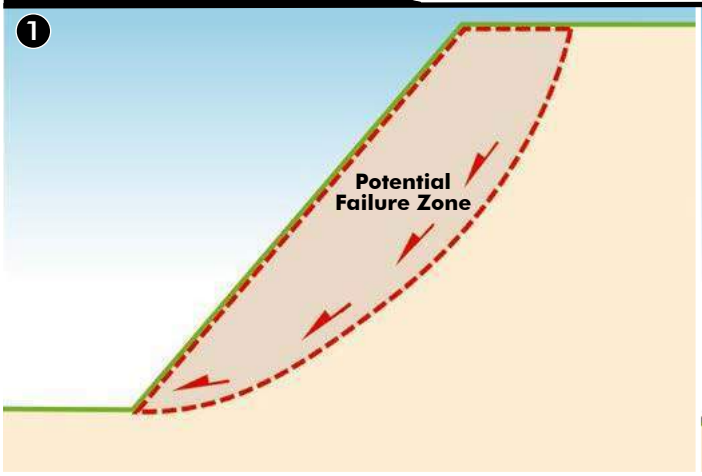
The Platipus® anchor system can be used in many situations. Below are some illustrations of the most common circumstances.

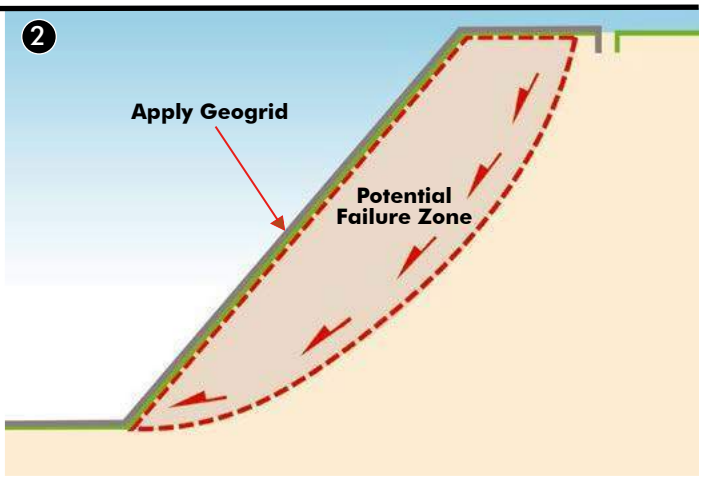
EROSION CONTROL

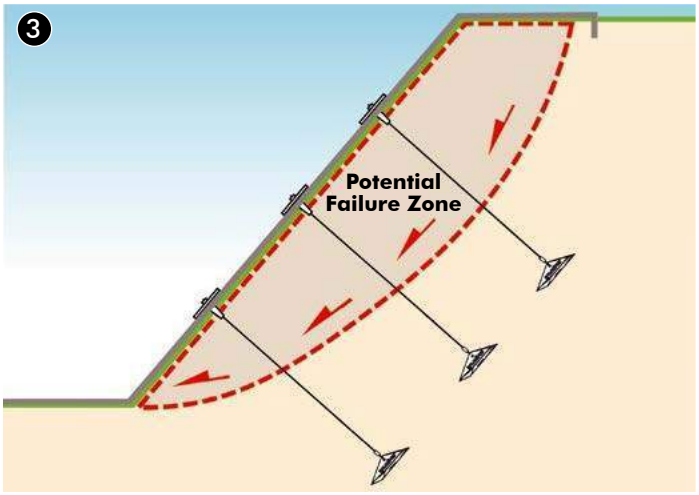
SHALLOW SLIP FAILURES



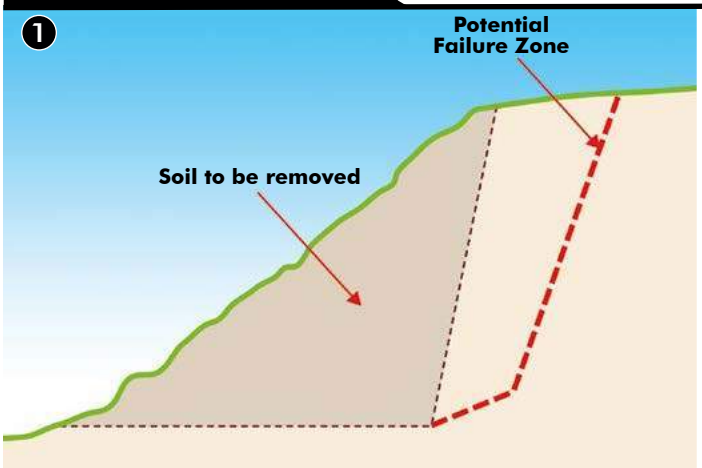
DEEP SEATED FAILURES

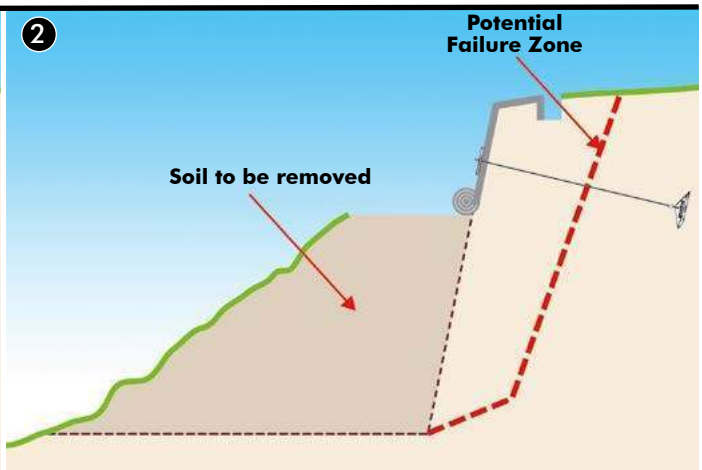


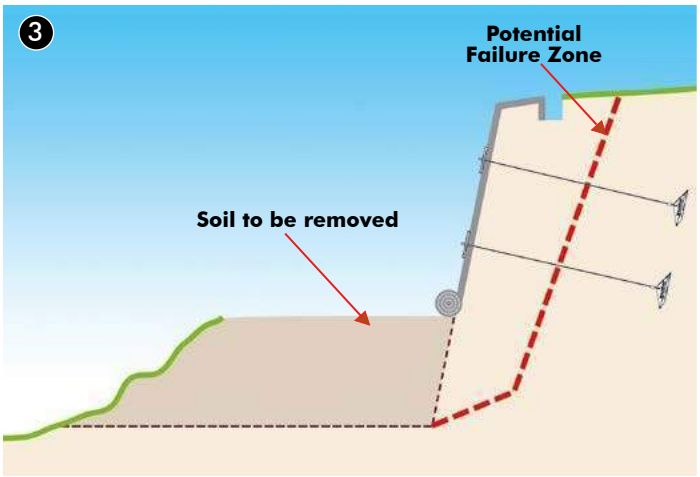




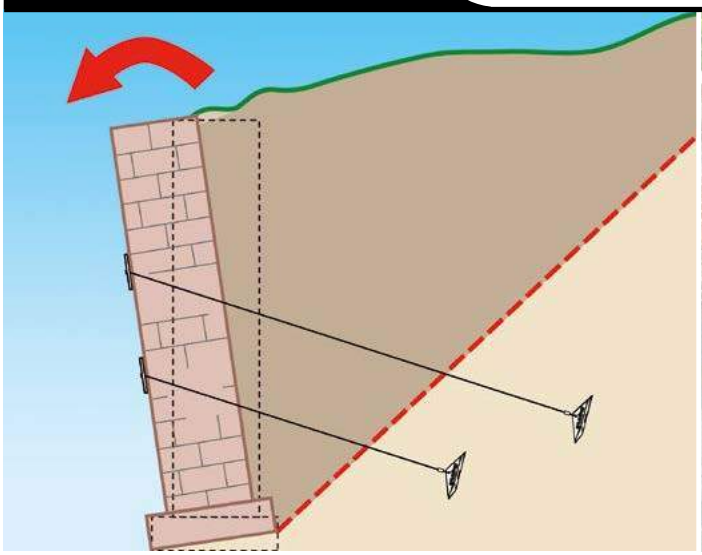
CUT FACE SLOPES







RETAINING WALL FAILURES



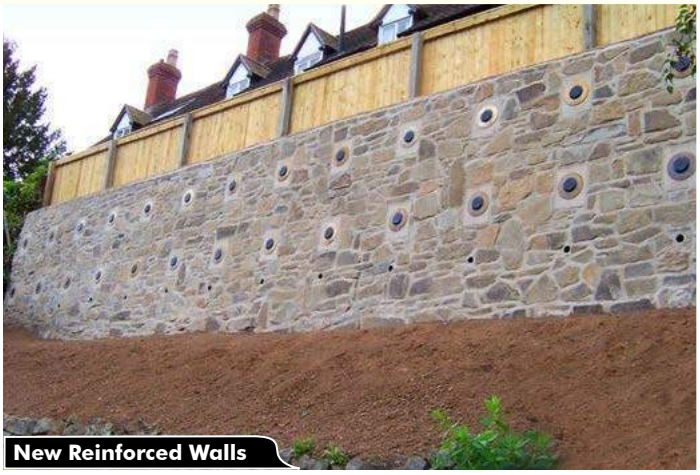
TYPICAL EXAMPLES

The Platipus® anchor system delivers excellent performance for an increasing range of applications. The following pages show a portfolio of projects we have completed over the last few years and have been divided into specific areas.

RETAINING WALLS

Timber

Cast in-situ Wall



New Reinforced Walls

Remedial Solution

SLOPE STABILISATION

Temporary Support

Permanent Rail

Difficult Access

Deep Excavation

BRIDGE REPAIR

Bridge Abutments

Spandrel Walls

Wing Walls

Deck Replacement

SHEET PILING

Temporary Support

Excavation

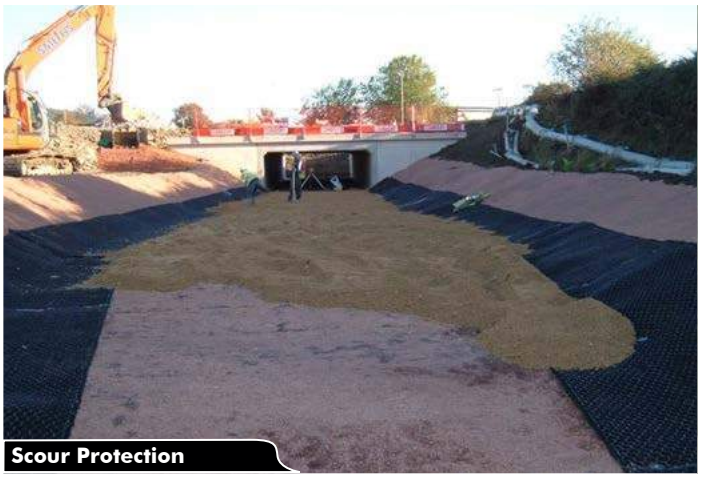
Permanent Support

Canal Bank Stabilisation

EROSION CONTROL

Coastal Erosion

Surface Erosion



Scour Protection

Flood Protection

GABIONS

Additional Support

Rotating

Emergency Support

New Build

ROCK RETENTION

Railway

Difficult Access

Coastal

Highways

BUOYANCY CONTROL

Pipelines

Storm Water Tanks

Water Cascades

Buoyancy

DRAINAGE SOLUTIONS

Increase Soil Strength

Increase Slip Plane Friction

Dual Draining & Restraining

Deep Penetration

GUYED STRUCTURES

Leisure Balloons


Permanent Structures


Signal Gantries

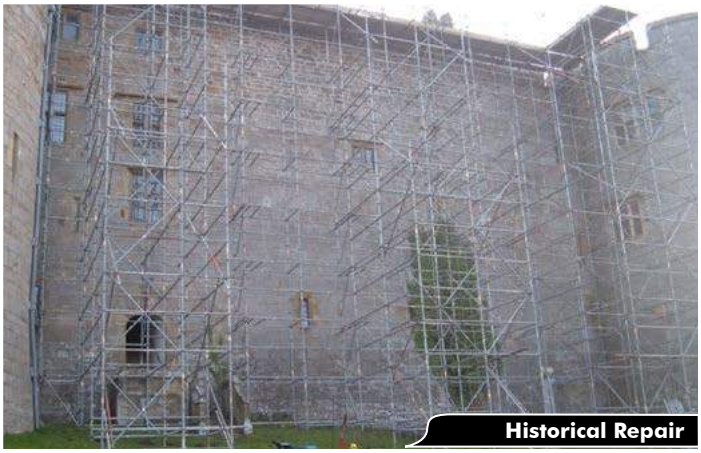

Temporary Structures

SCAFFOLDING SECURITY


Temporary Support


Power Line Crossing


Rail


Historical Repair

FOUNDATIONS

Mooring Pontoons

Fence Posts

Handrail

Footbridge

LANDFILL CAPPING

Steep Gradients

Rapid Installation

Aesthetically Pleasing

Environmentally Friendly

GENERAL SECURITY

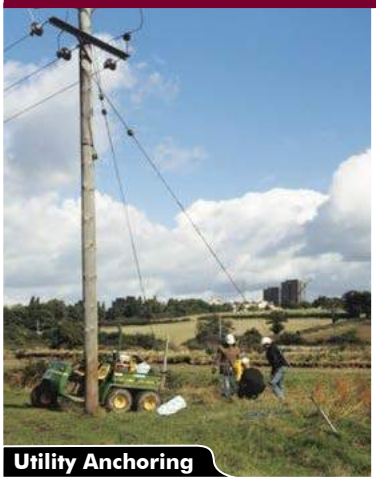
Aircraft


Pitch Cover

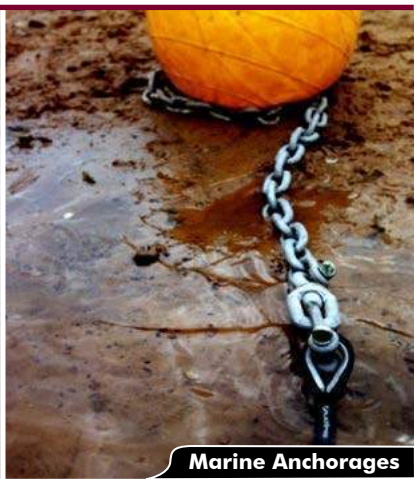

Safety Boom

Boat

PLUS MANY MORE


Utility Anchoring


Stages


Marine Anchorages


Rope Courses


Tree Anchoring


Winch Points

SOME OF OUR CLIENTS

Contractors

- Sir Robert McAlpine
- Alun Griffiths Contractors Ltd
- Amco
- Amec
- APB Group
- Ascon Ltd
- Balfour Beatty
- Barr Environmental Ltd
- BSR Metro
- Byzak
- Carillion
- Cementation Foundations-Skanska
- Clancy Docwra
- Commercial Marine & Piling Ltd
- Costain
- C Spencer Ltd
- Day Construction
- Dew Construction
- BAM Nuttall
- BAM Ritchies
- Carey Group
- Galliford Try
- Jackson Civil Engineering
- J N Bentley
- J T Mackley
- Land & Water Group Ltd
- Lumsden & Carroll Construction
- MacKenzie Construction
- May Gurney
- Morgan Sindall
- Morrison
- Osborne Ltd
- Phi Group Ltd
- Taylor Woodrow
- TRAC Structural
- Vinci
- Volker
- W A Developments

Consultants

- Adams Consulting Engineers Ltd
- AECOM
- Andrew Waring Associates
- Arcadis
- Arup
- Atkins
- BDS Consultants
- Bunyan Meyer and Partners
- Capita Symonds
- CH2M
- Clarke Nicholls Marcel
- Glamorgan Engineering Consultancy
- Jacobs
- Mott MacDonald
- Mouchel Group
- MWH
- Owen Williams Rail
- Paul Carpenter Associates
- Pell Frischman
- Ringway Parkman
- W A Fairhurst
- WYG

Local Government

- Birmingham City Council
- Bristol County Council
- Cambridgeshire County Council
- Crewe and Nantwich Borough Council
- Derbyshire County Council
- Dorset County Council
- Dudley Metropolitan Borough Council
- Eden District Council
- Exeter City Council
- Gloucestershire County Council
- Hampshire County Council
- Monmouthshire County Council
- Moray Council
- Newport City Council
- Northumberland County Council
- Powys County Council
- Reigate & Banstead Borough Council
- Shropshire County Council
- Suffolk County Council
- Surrey County Council
- Swindon Borough Council
- Teignbridge District Council
- Torfaen County Borough Council
- Wiltshire County Council

Significant Other Clients

- Amber Valley Housing Ltd
- Barratt Homes
- Bellway Homes
- CRT
- De Boer Structures (UK) Ltd
- Environment Agency
- Gaz de France
- TFL
- Metronet Rail
- MOD RAF
- NHBC
- Network Rail
- Northumbrian Water
- RNLI
- Shanks
- Southern Water

Please Note: This is not an exhaustive list and we apologise to anybody we may have left off.

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E: civils@platipus.us

181223

SECTION 321313 – CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes concrete pavement.

C. Related sections include:

1. Division 01 Section 014000-QUALITY REQUIREMENTS
2. Division 31 Section 312300-EARTHWORK
3. Division 33 Section 334000-STORM DRAINAGE

1.3 SUBMITTALS

A. Shop Drawings: For heated walks, paving areas showing the layout of expansion joints, tubing and manifold areas.

1. Submit to Project Representative for approval.

2. Design tubing system to minimize the crossing of expansion joints. Adjustments can be made to correspond to design requirements of the tubing system, with approval from Project Representative.

B. Warranties: Submit written special warranty as specified in this Section. Include contact information, description of coverage, and start date for each special warranty.

1.4 QUALITY ASSURANCE

A. Provide required testing and inspection as indicated in Division 01 Section “General Requirements - Quality Requirements.”

B. Concrete sampling, testing, and inspection shall conform to the following requirements:

1. Sampling Fresh Concrete: ASTM C172, except initial Samples shall be taken immediately after first 1/4 cubic yard (CY) has been discharged and subsequent Samples shall be taken as specified herein. If found to be in non-conformance, the concrete shall be removed from the forms.

2. Slump: ASTM C143, except initial Sample shall be taken in accordance with paragraph above. Additional tests shall be made for each set of compressive strength test specimens, and as required by the Project Representative.

3. Air Content: ASTM C231, except as previously specified herein and additional tests at the end of the load, if possible.

4. Concrete Temperature: Taken each time compression test specimens are made and hourly when temperature is 40 degrees F and below and over 80 degrees F.

5. Unit Weight: ASTM C138, except the Sample volume shall be equal to air content specimen.

6. Compressive Strength: ASTM C31 and C39, except one set of 3 cylinders for every 40 cy or fraction thereof. One specimen shall be tested at 7 days and the remaining 2 specimens shall be tested at 28 days. Strength level of the concrete will be considered unsatisfactory if the 7 day compressive strength does not equal or exceed 60% of the 28 day design strength. Strength level of concrete will be considered satisfactory if the average compressive strength of two consecutive 28 day tests equals or exceeds the 28 day design strength, and neither individual strength test results falls below the specified compressive strength requirement by more than 100 psi.

7. Inspection: Monitored by the Project Representative.

8. Frequency: In accordance with Division 01 Section “General Requirements - Quality Requirements.”

9. Concrete Replacement: Failure of a test or to follow proper installation procedures will require that the concrete be removed and properly replaced at Contractor’s expense.

10. Additional Tests: Contractor may have the testing agency make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42. Contractor shall pay for all such tests conducted. Holes shall be patched at the Contractor’s expense.

1.5 SEQUENCING AND SCHEDULING

A. Concrete shall not be placed after October 15 without written permission from the Project Representative.

1.6 WARRANTY

A. Furnish and sign 2 year written warranty (last page of this section) which shall cover cracking, spalling, settling, finishing and forming.

PART 2 - PRODUCTS

2.1 CEMENT

A. Portland cement conforming to the requirements of the current specifications for Portland Cement ASTM C150 Type 1L.

2.2 AIR-ENTRAINING ADMIXTURE

A. Conform to ASTM C260 for concrete.

2.3 FINE AGGREGATE

A. Limestone or other fine aggregate that is free of soft particles or other material that could cause staining or pitting of the pavement surface. For gradation purposes only, the material shall conform to MDOT Specification 2NS.

2.4 COARSE AGGREGATE

A. Well-graded limestone. Gradation and physical requirements to conform to MDOT Specification 6AA.

2.5 WATER

A. Potable.

2.6 REINFORCEMENT

A. Welded Wire Reinforcement:
   1. Standard; Welded wire fabric (6 x 6 - W4.0 / W4.0) in flat sheets only, conforming to ASTM A1064.
   2. Heavy duty and heated pavement; Welded wire fabric (4 x 4 - W4.0 / W4.0) in flat sheets only, conforming to ASTM A1064.

B. Bar Reinforcement: No. 3, No. 4 and No. 5 bar reinforcement as specified on the Drawings. It shall be new billet stock of intermediate grade in accordance with ASTM A615.

2.7 DOWELS

A. Construction Expansion Joints:

   1. No. 5 speed dowel 9 inches long, as manufactured by Greenstreak, Inc., 3400 Tree Court Industrial Blvd., St Louis, MO; 800-325-9504; or approved equal.

   2. Dowel: 18 inches long, No. 5 smooth epoxy-coated rebar (coated all surfaces); or approved equal.

   3. 1/4” x 4-1/2” x 4-1/2” electroplated zinc steel, ASTM A36, ASTM B633 with pocket formers

      a. Diamond Dowel System as manufactured by PNA Construction Technologies www.PNA-INC.com ; 800-542-0214 ; or approved equal.

B. Construction Joints:

   1. As specified above.

2.8 FORMED KEYWAY

A. Standard keyway, 1-5/8-inch x 1-3/4-inch x 2-3/4-inch, as manufactured by Dee Concrete Accessories Company, P.O. Box 11119, Chicago, IL 60611; or approved equal.

2.9 ASPHALT EXPANSION JOINTS

A. Conform with ASTM Specification D994-53. Fiber joint material is not acceptable.

2.10 JOINT SEALER

A. Tremco Spectrem 800. Primer: Tremco Silicone Primer No. 23. Tremco-Sealant/Weatherproofing Division, 3735 Green Road, Beachwood, OH 44122; 800 321 7906.

2.11 CURING AND ANTI-SPALLING COMPOUNDS

A. Curing and Anti-Spalling Compound:

1. For use when the concrete is placed at 40 degrees F and above.

2. Sealtight brand Lin-Seal Emulsion curing and sealing compound; Clear emulsion product (not to be confused with Lin-Seal or Lin-Seal white).

3. Manufactured by M.G. by W.R. Meadows, Inc, PO Box 338, Hampshire, IL 60140 0338; 847-683-4500, 800-342-5976.

B. Waterproofing Compound:

1. For use when the concrete is placed below 40 degrees F or when the concrete pavement is within 50 feet of building entrances; or both. Either of the following will be accepted.

2. Products:

a. Lifetime™ Water Sealant by Coatings International, Inc., 112 North Monroe, N.E. Rockford, MI 49341; 616-863-6529; Fax: 616-863-1076; www.coatingsinternational.com

b. Consolideck Saltguard WB by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046; 785-865-4200; Fax: 785-830-9016; www.prosoco.com.

C. Evaporation Retardant:

1. Conspec Aquafilm by Conspec Marketing & Manufacturing, 636 S. 66th Terrace, Kansas City, Kansas 66111; 800-348-7351

2. Confilm Evaporation Reducer by BASF Construction Chemicals, LLC, 23700 Chagrin Boulevard, Cleveland, Ohio 44122-5544, 800-628-9990; Fax 216-839-8821

3. Approved equal

2.12 ADMIXTURES

A. As approved by Project Representative.

2.13 FORMWORK

A. Steel or wood forms of an approved section shall be used throughout the construction. On radii 3 feet or less, 1/4-inch plywood or masonite shall be used. All forms shall have a height equal to concrete thickness. Built-up, battered, bent, twisted, or broken forms shall be removed from the Work. Expansion joint materials shall not be used.

2.14 CONCRETE QUALITY

A. The mixture shall contain 6 sack Portland cement concrete, coarse aggregate, fine aggregate admixtures and water. The concrete mix design shall have a minimum 4000 psi compressive strength at 28 days. The maximum allowable slump shall be 4.5 inches. Aggregates shall be batched by weight. Air content shall be 5% to 8%. Maintain a maximum water/cement ratio of 0.46 pounds of water per pound of cement.

B. Contractor shall provide the Project Representative with delivery tickets which shall list slump, sack mix, percent of air entraining agent, time the truck left the plant, arrived on the site and departed the site, and water added at the site.

C. When requested, Contractor shall provide documentation from the concrete supplier certifying that the concrete meets the specifications of this section.

D. Color shall be limestone. Consistency of the color shall be uniform throughout the Project.

2.15 DETECTABLE WARNING PLATES

A. 24” x 24” Duralast Detectable Warnings, Product number 00700571, Natural Finish by East Jordan Iron Works, Inc.; 800-626-4653

PART 3 - EXECUTION

3.1 PLACING FORMS

A. Forms shall be so constructed and set as to resist, without springing or settlement, the pressure of the concrete. Forms shall not deviate more than 1/8-inch in 10 feet from the true horizontal alignment and no more than 1/8-inch in vertical alignment.

B. Where forms are set above general surrounding area, earth shall be placed along outside edges of forms to ensure stability.

C. Forms shall be cleaned and oiled each time they are used.

D. Forms shall be reviewed by the Project Representative prior to pouring.

3.2 PLACING REINFORCEMENT

A. Place reinforcement mesh as indicated on the Drawings and in the following areas:

1. Where the pavement crosses a recently filled trench and extending a minimum of 5 feet beyond the trench wall.

2. Where fill soil of 18 inches or more occurs.

3. As directed by the Project Representative.

B. Concrete shall be placed in 2 layers when mesh reinforcing is used. Use of brick, stones, etc., or unusual raising with bars or tools is prohibited. Proper positioning of the mesh can be achieved by either; (1) the use of metal or plastic chairs specifically intended for holding mesh reinforcement in the soil conditions present at the required depth, or (2) placing and consolidating a layer of concrete at the specified elevation of the reinforcement prior to placing reinforcement and a top layer of concrete

3.3 PLACING CONCRETE

A. Placing 6-inch (or greater, if specified) concrete shall not commence until the subbase and forms have been approved. Subbase shall be moistened in advance of concreting, but shall not be muddy or excessively wet. A sufficient quantity of forms shall be placed to accommodate the concrete that is scheduled to be poured at any one time. Concrete shall be deposited with a minimum of re-handling and shall be spaded adjacent to forms and joints. In the case of isolation joints, concrete shall be placed simultaneously against both sides of the joint.

B. Concreting shall not be continued when the air temperature is below 45 degrees F, unless the aggregates or water, or both, are heated to produce a placing temperature of the concrete between 60 degrees F and 90 degrees F., and unless adequate provisions are made for maintaining protection against freezing of the concrete for at least 7 days after placing. No concrete shall be placed on frozen subbase.

C. Should placement of concrete be necessary over or near tree roots, a thin layer of sulfur shall be placed on the area of the subbase which may be affected by the roots. Owner shall place sulfur. Provide 2 day notice to coordinate work with Owner’s crews.

3.4 JOINTING

A. As indicated on the Drawings, as directed in the field by the Project Representative and in the following situations, unless otherwise specified:

1. Control (contraction) joints shall ordinarily be placed at intervals equal to the width of the slab or 8 feet, whichever is less. They shall be 1/8-inch to 3/16-inch wide and 1-1/4 inch deep, or 1/4 the thickness of the slab, whichever is greater. Where slabs exceed 8 feet in width, a straight longitudinal control joint shall be placed along the centerline of the slab. This joint shall begin and end only at isolation or construction joints.

2. Expansion joints shall be placed as indicated on the Drawings and if not conflicting with Drawings at intervals of at least every 40 lineal feet (LF), adjacent to footings and foundations, adjacent to curbs when required, adjacent to existing concrete where new

concrete is to abut or at next available joint that is parallel to the edge of the existing concrete. Continue joints in adjoining concrete, in the same location as existed in the concrete that was removed, and where 2 or more walks intersect. Joints shall be placed in a vertical position through the entire slab thickness.

3. Construction joints (with dowels) shall be installed when placing operations are delayed more than a 1/2-hour at locations where normal control joints would occur, as indicated on the Drawings and as directed by the Project Representative.

B. Joints shall be tooled to the specified depth. If the pavement thickness is greater than 6 inches, sawing will be permitted after the joints have first been tooled. The only exception to this requirement is for basketball courts, where only saw cutting is permitted.

C. Joints shall be perpendicular to the edge and tangents and normal to curves. The joints shall not vary from the true line more than 1/4-inch.

D. When new walkways are adjacent to new curb and gutter or when required by the Project Representative, the Contractor shall install a Diamond Dowel System.

E. Place sealant in non-heated pavement joints when specified, according to manufacturer's recommendations, using primer as specified.

3.5 FINISHING

A. Concrete shall be placed and struck off with a straight board until voids are removed in the surface at the required grade and cross section.

B. Adding water to the surface of the concrete to assist in finishing operations is not permitted. If a finishing aid is permitted by the Project Representative, it shall only be an approved product for that intended purpose and then applied according to the product recommendations.

C. Immediately after the concrete has been struck off, the surface shall be floated with a magnesium bull float, just enough to produce a smooth surface free from irregularities. Edges shall be rounded to a radius of 1/4-inch with an approved edging tool. Jointing shall then commence immediately after edging and before the large aggregate in the concrete has started to settle.

D. The entire surface shall then be steel-troweled so that the large aggregate is set and the surface is free of edging joints and trowel marks.

E. The surface shall be heavy-broomed, keeping mortar out of joints. Brooming direction shall generally be perpendicular to the normal path of travel, unless otherwise directed by the Project Representative. Provide 2-inch retool at joints, if detailed on the Drawings.

F. Surface variations greater than 1/8-inch in 10 feet are unacceptable.

G. Walks shall be protected from pedestrian traffic for 2 days and vehicles for 7 days.

H. Concrete shall be stamped at each end of the work with the Contractor's name and the current year.

3.6 CURING AND ANTI-SPALLING COMPOUND APPLICATION

A. For temperatures above 40 degrees F, concrete shall be cured utilizing the specified curing/anti-spalling compound in accordance with product specifications using only a motorized sprayer. This application includes the sides of the concrete, once the forms have been removed.

B. For temperatures between 32 degrees F and 40 degrees F and on concrete within 50 feet of building entrances, cure pavement using an approved wet cure method for a period of not less than 7 full days while maintaining a concrete temperature above 34 degrees F for 14 days. After 30 days, the specified water proofing compound shall be applied according to product specifications.

3.7 DETECTABLE WARNING PLATES

A. Follow manufacturer's installation specifications to properly install detectable warning plates per site plan layout. Pay special attention to be sure the plastic concrete comes through all the holes in the plate to eliminate all cavities below the plate that could trap water.

3.8 HEATED PAVEMENT AREAS

A. Layout:

1. Each zone shall have its manifold area within the area heated and each zone shall be independent from other zones and separated with sealed expansion joints.

2. All main line piping shall be bedded under the concrete slab. If this is not possible, then the main line piping shall be installed in appropriate sleeving to protect it from damage by gardening equipment.

B. Coordinate height of sand chair to correspond to the depth of tubing from the concrete paving surface to top of tubing.

C. Reinforcing shall be held at the correct elevation with sand chairs. No other materials shall be permitted.

D. Drainage from a heated pavement area shall flow to a catch basin within the heated pavement area or directly adjacent to the heated paving. No drainage shall flow onto a cold pavement surface.

E. In areas designated on the Drawings as a barrier free parking space, either so noted or with a uniform barrier free graphic symbol, the slope of the parking space and adjacent access aisle shall not exceed 2 percent (1/4-inch per foot) in any direction.

F. Installation of concrete shall be as specified in this section.

G. For heated pavement systems, the heated portion of the concrete shall be stamped with the words "Heated Pavement Limit." Stamp locations shall be approved by the Project Representative.

1. Text shall be placed along the entire edge of the heated concrete at uniform increments of approximately 10 feet to 15 feet and shall be readable when standing on the heated pavement. This includes along buildings and structures.

2. If the edge of the heated surface is curb/gutter, then the stamp shall be placed on the gutter pan rather than on the adjacent pavement.

3. The cast aluminum stamp may be available for use from Engineering and Architectural Services, Physical Plant Division if arrangements are made in advance and the stamp is available. Otherwise, Contractor is responsible to secure a stamp that is approved by the Project Representative and identical to the EAS heated pavement stamps reading “Heated Pavement Limit.”

(CONCRETE PAVEMENT WARRANTY ON THE FOLLOWING PAGE.)

CONCRETE PAVEMENT WARRANTY

PROJECT:
CONTRACTOR:
OWNER: **BOARD OF TRUSTEES**
MICHIGAN STATE UNIVERSITY

We, the undersigned, herewith warranty all the work to be free from defective workmanship and/or materials for **two (2) years** from November 1st of the calendar year of the date written below, in accordance with the requirements set forth in the Drawings and Specifications for the above-named Project.

The Contractor agrees that by acceptance of this Work and in consideration thereof, for them and for each of their Subcontractors, binds themselves to all warranties called for. The Contractor shall warranty all work, except as noted elsewhere in these Contract Documents in which a longer warranty is specified. This shall include, but not be limited to, the following defects:

1. Cracking
2. Spalling
3. Settling
4. Finishing
5. Forming

If during the warranty period, it is found by the Owner's Representative, that the warranty Work needs to be repaired or replaced because of the use of materials, equipment, or workmanship which is inferior, defective, or not in accordance with the terms of Agreement, the Contractor, upon notification, shall promptly and without additional expense to the Owner:

a. Place in satisfactory condition all of such warranted Work,
b. Make good all damage to the project, or contents thereof, which is a result of such unsatisfactory warranted Work, and
c. Make good any Work, materials and equipment that are disturbed in fulfilling the Warranty, including any disturbed work, materials and equipment that may have been warranted under another contract.

Should the Contractor fail to proceed promptly in accordance with the Warranty, the Owner's Representative may have such work performed at the expense of the Contractor and their surety.

CONTRACTOR: _____ DATE:_____

ADDRESS: _____

AUTHORIZED REPRESENTATIVE: _____ _____
(Print) (Signature)

SUBSCRIBED AND SWORN TO BEFORE ME,

THIS_____DAY OF_____

A.D._____

NAME

MY COMMISSION EXPIRES

END OF SECTION 321313

SECTION 323119 – ORNAMENTAL FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes ornamental railings, painted metal fences and gates, and vinyl coated post and chain systems.

1.3 REFERENCES

A. ASTM F525 and ASTM F567 where applicable herein.

1.4 SUBMITTALS

A. Shop Drawings: Furnish detailed and scaled Shop Drawings of railing including weld locations and field construction method for approval by Owner.

B. Warranties: Submit written special warranty as specified in this Section. Include contact information, description of coverage, and start date for each special warranty.

1.5 QUALITY ASSURANCE

A. Fabrication Inspection: The following in-progress inspection may be made by the Owner, at the Owner's discretion, between fabrication stages listed below:

1. Metal fabrication.
2. Primer application.
3. Final painting.
4. Installation.

1.6 WARRANTY

A. Contractor agrees that by their acceptance of this Work and in consideration thereof, for Contractor and for each Subcontractor, binds Contractor and each Subcontractor to all the guarantees and warranties. Contractor shall guarantee materials to be free from defects for 1 year after the date of final acceptance.

B. If within warranty period, it is found that the guaranteed materials need to be replaced because of the use of materials which are inferior, defective, or not in accordance with the terms of the

Agreement, Contractor, upon notification, shall promptly and without additional expense to Michigan State University replace such materials immediately.

C. Should Contractor fail to proceed promptly in accordance with the guarantee, the Owner may have such replacements made at the expense of Contractor and Contractor's sureties.

D. Contractor shall execute and deliver to the Owner, before final settlement, a written warranty subject to and stipulating the provisions above.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials shall be new and the best of their respective kind.

B. Materials shall conform in every detail to the Specifications herein mentioned and standard mill tolerances.

C. If required by the Owner, Contractor shall furnish affidavits from manufacturers, stating that the materials meet or exceed these Specifications.

2.2 PRIMER SOURCE

A. Lilly Perfection, Catalyzed Acrylic Urethane Finish (F-70 Gloss Black), epoxy glaze primer; 715 East Maryland Street, Indianapolis, Indiana 48202-3999; 800-428-9199.

2.3 PAINT SOURCE

A. Perfection Paint by Lilly, Futurac Acrylic Urethane Enamel (electrostatic application) (F70), 715 East Maryland Street, Indianapolis, Indiana 48202-3999; 800-428-9199.

2.4 METAL

A. Surfaces of railing and post shall contain no imperfections such as scratches, dents, bubbles or an abrasive surface.

B. Welded joints including those on railing post tops, seams and corners shall be ground smooth to eliminate indication that a welded joint exists. Welded corner shall exhibit only a slight roundness of 1/16-inch radius.

C. Metal posts shall be hot rolled and seamless steel with a 1/4-inch wall.

2.5 PAINT

A. Apply primer and paint electrostatically according manufacturer's recommendations to a smooth surface free of imperfection and grease, oil, dirt or other contaminants.

B. Painted surface shall have a uniform finish.

C. Bolts shall be painted identical to posts prior to assembly.

D. Touch-up painting will be permitted in the field after installation. Touch-up imperfections in the paint surface according to manufacturer's recommendations.

2.6 VINYL COATED POST AND CHAIN SYSTEM [IF SPECIFIED]

A. 3/8-inch proof coil chain manufactured by The Commercial Group, G-2427 East Judd Road, Burton, MI 48529; 800-392-7940, 810-744-4540.

B. 3/8-inch connector link manufactured by The Commercial Group.

2.7 FABRICATION

A. All welds shall be continuous and without pin holes.

B. Fabricate posts and paint gloss black, quantity required as indicated on the Drawings.

C. Furnish connector links and paint gloss black before assembly.

D. Caps for steel posts shall be welded continuously. Pin holes in welds are not acceptable. Weld shall not distort outer edge of cap.

E. Caps for aluminum posts shall be welded only at corners. Weld shall not distort outer edge of cap.

F. Fence members shall be fabricated from a single piece of metal (spliced not acceptable).

G. Finial to be securely attached to fence post with a weld, as specified. Bottom edge of finial shall be well defined with a uniform edge.

H. All surfaces to be painted shall be prepared according to paint Manufacturer's specifications.

I. Connector link for post and chain system shall be welded.

2.8 PAINT SYSTEM APPLICATION

A. Refer to attached specifications for Lilly Epoxy Glass Primer and Acrylic Urethane Enamel.

B. Minimum coating thickness shall be:

1. Epoxy Primer: 3 mils.
2. Epoxy Hi-build Primer: 4 mils.
3. Acrylic Urethane Enamel: 3 mils.

C. Owner will inspect each application for quality and thickness.

PART 3 - EXECUTION

3.1 PREPARATION

A. Field Measurements:

1. Contractor is responsible for calling MISS DIG prior to erection of the fence.

2. Contractor shall field measure the fence lengths to determine locations for odd length fence section(s).

3. Odd length sections shall occur at the middle of the fence run.

4. Locations of odd length fence sections shall be clearly indicated on the Shop Drawings.

3.2 INSTALLATION

A. General:

1. Perform Work in a professional and workmanlike manner.
2. Legally dispose of waste material and excavated soil off the Owner's property.

B. Contractor shall be responsible for calling MISS DIG prior to erection of fence and confirming locations of utilities prior to excavation. Provide the MSU office (517-353-5142) with the MISS DIG number as soon as it is provided.

C. Contractor is responsible for field layout based on the Drawings. Layout shall be approved by the Project Representative prior to installation.

D. Holes shall be auger drilled.

E. Posts shall be vertical and maintain a uniform height relative to each other.

F. Chain shall have consistent sag (to be determined by the Owner) throughout the Project and as indicated approximately on the Drawing detail.

G. Concrete Footing:

1. Footing shall be 42-inch deep and a minimum diameter of 10 inches.

2. Post shall be in the center of the hole with a minimum of 2 inches of concrete around the post.

3. Top 6 inches of the concrete footing shall be formed and contain a 1/2-inch wash to shed water away from the post.

4. Concrete shall sufficiently cure to eliminate broken footings. Footings that are broken during installation shall be completely removed and replaced.

H. Post Spacing: For post and chain system.

1. 9-foot on-center for single chain.
2. 8-foot on-center for double chain.

3.3 PAINT TOUCH UP

A. Very limited “touch up” painting will be permitted after installation. Touch up imperfections in the paint surface according to manufacturer’s recommendations. Review touch up locations with the Project Representative before executing touch up work.

3.4 CLEANING

A. Fence installation will not be considered complete until excess excavated materials, cut wires, spilled concrete, or other debris, including the existing fence to be removed, resulting from the fence construction, is removed.

END OF SECTION 323119

SECTION 324000 – SITE APPURTENANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This Section Includes:

1. Site Appurtenances such as: Posts, bike loops, and site furnishings.

2. Install Owner-provided Landscape Forms products as shown on Drawings.

3. Normal activities and materials to construct the various items below or additional work not listed below shall be considered incidental and not due additional compensation. To be considered for additional compensation, work items must be identified and noted by the Project Representative, prior to the installation.

C. Sign(s), (manufacturing or installation) for posts or bollards, is not part of the Contract.

1.3 DEFINITIONS

A. MDOT Specification: Michigan Department of Transportation, 2012 Standard Specifications for Construction.

1.4 QUALITY ASSURANCE

A. Refer to Division 01 Section "General Requirements - Quality Requirements."

B. Installation shall meet requirements as indicated by the Project Representative.

PART 2 - PRODUCTS

2.1 POST AND CHAIN FENCE

A. Provided by Owner
B. Installed by Contractor

PART 3 - EXECUTION

3.1 GENERAL

A. Installation shall be according to Drawings provided. If not provided, installation shall be according to Project Representative's instructions.

3.2 POST AND CHAIN INSTALLATION (2 TYPES OF SYSTEMS)

A. Install as indicated on Drawings. Posts shall be positioned plumb.

B. Space posts as indicated on Drawings.

C. Top of concrete footing shall be below the existing grade as indicated on Drawings.

D. Installation includes installing vinyl coated chain with specified connectors (including weld). Prime and paint connectors after welding with same paint system used on the posts.

3.3 PLAQUE BASES AND PLAQUE INSTALLATION

A. Usually, this will be hand work in a confined area.

B. Excavate as required with a 42-inch deep footing below ground and up to 12 inches above.

C. Form above ground portion with a slight cant and shape to accommodate the provided plaque.

D. Securely install plaque and the plastic concrete, while protecting the plaque surface from contamination from the concrete.

E. Finish above ground surface after removal of forms.

F. Clean up site after removal of forms.

END OF SECTION 324000

SECTION 334000 – STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

B. This section includes storm drainage systems.

C. Related sections include the following:

1. Division 01 Section “General Requirements - Temporary Facilities and Controls.”
2. Division 31 Section “Earthwork.”

1.3 DESCRIPTION

A. Storm and sanitary sewers shall be 2 separate systems.

B. New manholes and catch basins shall be precast construction except for bases.

C. Surface drainage shall be to catch basins; no storm water shall pass into a storm sewer without first passing through a catch basin.

D. Concrete storm sewer pipe shall use a rubber "O" ring joint.

E. Manholes and catch basins shall be constructed as specified herein and indicated on Drawings.

1.4 REFERENCES

A. Except as herein specified or as indicated on the Drawings the work of this section shall comply with the following:

1. AASHTO Standards M36 – Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains

2. M218 – Sheet Steel, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.

3. MDOT:

a. 2012 MDOT Standard Specifications for Construction.
b. MDOT Standard Plans.

1.5 SUBMITTALS

A. Before commencing work, the Contractor shall provide an affidavit from the material manufacturers, that their materials meet the Specifications.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SECTIONS

A. ASTM C-478: Cone section shall be eccentric to allow for a straight vertical ladder.

2.2 PRECAST OUTLET HEADWALL

A. MDOT Standard Detail R-85-D.

B. Contractor shall complete connection of headwall with pipe using Type M mortar.

2.3 MARMAC COUPLER

A. Macwrap Coupler.

B. Install per manufacturer's instructions.

2.4 STRUCTURE BLOCK AND BRICK

A. Block: ASTM C-139.

B. Brick: ASTM C-139.

2.5 COVERS AND GRATES:

A. As specified on Drawings, or as indicated below:

1. Curb Inlet: EJIW 7045, M1 grate.

2. Square Inlet: EJIW 5105, M1 grate (for valley gutter pans).

3. Round Inlet – Light Duty: EJIW 1130, M3 grate.

4. Round Inlet – Heavy Duty: EJIW 1040, M1 grate for parking lots, M3 grate for walks – ADA compliant.

5. Manhole Structure: EJIW 1040, Type B – Vented cover.

6. Rolled Curb: EJIW 7065, M1 grate.

2.6 TRENCH DRAIN

A. Klassik Drain by Acodrain KS1005; or approved equal.

1. Drains: Part Number K1 through K3 sloped channels.
2. Universal Plastic Coatings: Part Number 96825.
3. Grates: ADA stainless grate DIN 19580 Class A.

B. Square Inlet: EJIW 5105, M1 grate (for valley gutter pans).

2.7 ADJUSTING RINGS

A. The inside diameter shall not be less than the diameter of the casting for which it is used.

B. Allowable types include:

1. Precast Reinforced Concrete: Without cracks. 2-inch to 6-inch thick, minimum 3000 psi. Reinforcement rod shall not be visible on the surface.

2.8 MANHOLE STEPS

A. EJIW 8500.

2.9 PORTLAND CEMENT

A. ASTM C150 Type 1.

2.10 HYDRATED LIME

A. ASTM C207.

2.11 SAND AND GRAVEL AGGREGATE

A. ASTM C33.

2.12 CONCRETE

A. Refer to Division 32 Section “Concrete Pavement.”

2.13 MASONRY CEMENT

A. ASTM C91.

2.14 CORRUGATED PERFORATED POLYETHYLENE DRAIN TILE

A. ASTM F405 with heavy sock.

2.15 PVC GASKETED DRAIN PIPE

A. Storm sewer up to and including 12-inch diameter and for pipe leading from catch basins.

1. SDR 35, ASTM D2729.

2. Other products as specified.
3. Rubber boot to connect pipe to structure.

2.16 REINFORCED CONCRETE PIPE

A. Storm Sewer 12-inch Diameter and Larger: ASTM C76.

2.17 CORRUGATED METAL PIPE

A. Manufacturers: Contec, Republic; or approved equal.

B. Pipe Material:

1. Galvanized (AASHTO M36) Zinc Coated Sheets (AASHTO M218).

2. Corrugations: Helical corrugations for shall form a minimum 45 degree angle with the longitudinal axis.

3. Pitch and Depth: 2-2/3-inch x 1/2-inch.

4. Wall Thickness: MDOT Class B.

5. Coupling Bands: Coating and wall thickness shall match pipes being connected. Type options:

a. Corrugated band with sleeve gasket.
b. Semi-corrugated band with O-ring.
c. Flat band with O-ring.

6. End Section: Flared end section.

7. Outlet Headwall: MDOT Standard Detail R-85-D

2.18 INLET STRUCTURE SILT SCREEN

A. Silt-Saver sold by Price and Company, Inc. 425 36th St., SW, Wyoming, MI 49548; 800-248-8230, 616-530-8230; or approved equal.

1. SS-100A: Fits round structures to 48-inch ID.
2. SS-200A: Fits square structures to 60-inch OD.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Connections and changes in direction or grade shall be made in manholes.

B. Structure bases shall be cast-in-place concrete, transit mixed with minimum compressive strength of 3000 psi at 28 days, formed and finished level. Precast bases may be used with written approval of the Project Representative and where required by extremely difficult site conditions. Base slab shall be fully cured before precast portions are set.

C. Precast concrete shall be used to construct structures. Only when precast sections are not manufactured in the size and shape required will block constructed structures be permitted. The Project Representative shall be notified prior to construction of block structures. Set precast sections in full mortar bed.

D. Trench drains shall be constructed so that they sit on a foundation of a minimum depth of 42 inches, measured from finish grade to bottom of structure.

E. Adjustment to Casting Elevations:

1. Concrete rings shall be used wherever possible to adjust casting elevations. Rings shall be set in full mortar bed. Use a maximum of 3 rings.

F. Tile shall be laid through the manhole and 3000 psi concrete shall be placed around the tile up to half of the diameter. The concrete shall slope from the walls of the manhole to the sewer. When there is a change in grade, direction, or pipe size, the flow channel shall be built from bricks and 3000 psi concrete to make a uniform, smooth change in grade, direction or pipe size.

G. Vertical elevation of the invert shall be within plus or minus 0.04 foot (1/2-inch) of required elevation. Horizontal alignment must meet the same tolerance.

H. Pipe Connections to Structures:

1. Connections with existing sewers shall be made at points and in a manner indicated on the Drawings and approved by the Project Representative.

2. Sewers being disconnected shall be sealed off with concrete.

3. If PVC pipe connects to an existing or new structure, the pipe shall connect with an appropriately sized rubber boot.

I. Catch basin sump shall extend 2 feet below the pipe outlet invert.

J. Construct a peripheral sub-drainage system for catch basins.

1. Install 4-inch diameter perforated polyethylene corrugated drain pipe with a heavy duty sock covering around each new structure and existing structure, if at least 4 vertical feet is exposed or the outlet pipe is exposed.

2. Pipe shall enter catch basin with a tee connector, 2 inches above and directly opposite the outlet invert.

3. The peripheral drain pipe shall be positioned at 1/4-inch to provide positive drainage to the catch basin. The peripheral drain pipe shall be placed over the outlet pipe. Do not cut and cap the drain pipe at the outlet pipe.

4. Backfill the drain pipe with properly compacted Class II sand to the finish subgrade.

3.2 TESTING AND INSPECTION

A. Internal Television Inspection of Storm Sewers:

1. General:

a. Inspect storm sewers using a closed-circuit color television pan and tilt camera.

b. Provide Engineer with videos in digital format and written logs to document the internal television inspection:

1) Written logs shall note the location of sewer laterals and pipe deficiencies by distance from the upstream manhole.

2) The video tape shall include audio commentary regarding the sewer condition.

c. Engineer will review the videos and written logs to verify that the storm sewers were constructed in accordance with the Contract Documents.

d. The videos shall verify that the storm sewers are clean and free of sediment and debris to the satisfaction of Engineer. Storm sewers not satisfactorily cleaned shall be promptly cleaned and reinspected by closed-circuit color television camera.

e. Television inspection shall be completed, documentation of television inspection shall be provided and Engineer shall determine that the sewers were constructed in accordance with the Contract Documents before payment for completed sections of sanitary sewer will be recommended to Owner.

2. Performance Requirements:

a. Inspection procedures and equipment shall meet the applicable standards as presented in the National Association of Sewer Service Companies (NASSCO) Recommended Specifications for Sewer Collection System Rehabilitation.

b. Each section of sanitary sewer between manholes shall be television inspected separately utilizing a video camera and related equipment specifically designed for the purpose of internal sewer inspection.

c. The camera speed shall not exceed 30 feet per minute.

d. The camera shall be stopped for no less than 10 seconds at the entrance manhole, each service lateral, exit manhole, and at points where the sewer is damaged or deficient.

e. Lighting for the camera shall be adequate to allow a clear picture of the entire periphery of the sewer and shall be varied as required to be effective for all pipe diameters inspected.

f. Cables and equipment used to propel the camera shall not obstruct the camera view or interfere with the documentation of the sewer conditions.

g. The video recording shall be continuous video file.

h. The mobile recording studio shall have adequate space to accommodate up to 3 persons for the purpose of viewing the video monitor while the inspection is in progress.

i. Whenever possible, the camera shall move in a downstream direction.

j. The location of the camera in the sewer shall be monitored by an accurate measuring system which records the distance traveled from the upstream manhole on the video.

k. Video and written logs shall be clearly labeled with the Project name and location identification.

l. If sewer has dirt and debris which prohibits video inspection, the sewer shall be cleaned and re-televised at no expense to Owner.

END OF SECTION 334000