State of Michigan

Department of Technology, Management and Budget
State Facilities Administration
Design and Construction Division

DCSPEC
Bidding and Contract Document
Minor Projects

File No. 511/26108.SAR
Department/Agency DMVA
Project Name Fort Custer Small Arms Berm
Location Fort Custer Training Center, Battle Creek, Michigan

April 9, 2026

SECTION 00003

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END OF SECTION

BID SUMMARY

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
3111 W. St. Joseph Street
Lansing, Michigan 48917

Bids must be submitted electronically at: https://sigma.michigan.gov/webapp/PRDVSS2X1/AltSelfService

FILE NUMBER	DEPARTMENT/AGENCY	
511/26108.SAR	Michigan Department of Military and Veterans Affairs	
CONTRACT TIME(S)	PROJECT NAME	LOCATION
July 21, 2026	Fort Custer Small Arms Berm	Fort Custer Training Center 1100 Denso Road Battle Creek, MI 49037
BID OPENING DATE	FOR AN EXAMINATION OF THE SITE CONTACT:	
April 29, 2026 at 2:00 pm ET	**Mr. Sarat Bobba, DLZ Michigan, Inc, sbobba@dlz.com**	

SEE SECTION 00100 INSTRUCTIONS TO BIDDERS AND SECTION 00700 GENERAL CONDITIONS PROVIDED WITH THE BIDDING DOCUMENTS.
BID: WE PROPOSE TO FURNISH, PERFORM AND COMPLETE THE ENTIRE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS IN CONSIDERATION OF THE BID PRICE (S) STATED BELOW.

FIRM NAME AND COMPLETE ADDRESS	TELEPHONE NUMBER and E-MAIL ADDRESS
	SIGMA VENDOR NUMBER (protected information required for processing payments)
☐ Qualified Disabled Veteran	
BIDDER'S SIGNATURE AND TITLE DATE	WITNESS' SIGNATURE DATE

By signing this bid above, bidder certifies their enclosed Qualified Disabled Veteran and Michigan-Based Business Certifications.

BASE BID FROM BID SCHEDULE (Include specified Allowances):

_____ Dollars $_____
(use words) (in figures)

Alternate1: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

Alternate 2: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

Alternate 3: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

A PERFORMANCE BOND AND A PAYMENT BOND ARE REQUIRED FOR ALL BIDS OVER $50,000.00. EACH BID MUST BE ACCOMPANIED BY A FIVE (5) PERCENT BID GUARANTEE. BUILDERS RISK INSURANCE IS REQUIRED TO BE PROVIDED BY THE CONTRACTOR UNLESS OTHERWISE INDICATED IN THE BID DOCUMENTS.

BIDDERS ARE ALSO CAUTIONED TO FAMILIARIZE THEMSELVES WITH ALL OF THE OTHER CONDITIONS OF THE CONTRACT.

Project Scope of Work:

The goal of the project is to remove and dispose of the lead contaminated soils at the small arms range backstop berm and reconstruct the berm. The Scope of Work, to achieve this goal, includes, but is not limited to:

1. Site Services, Mobilization, and Demobilization.
2. Characterization of the contaminated berm soils.
3. Remove, transport and dispose of contaminated berm soils.
4. Reconstruct the berm.
5. Site restoration.

The Bidder must figure its Base Bid on the specified, or Addendum-approved, materials and equipment **only**. No "or equal" or substitution proposals will be permitted after Bid opening, except as provided in the General Conditions.

Addenda: Bidder acknowledges receipt of Addenda: No. ___ dated: _____, No. ___ dated: _____ No. ___ dated: _____

BID SCHEDULE

Base Bid Schedule - The Bidder will complete the Work and accept as full payment, for the Work items listed, the following Unit Prices and/or Item Bid Prices, as applicable:

Base Bid Item No.	Bid Quantity	Unit	Description	Unit Price	Item Bid Price
1	1	Lump Sum	Mobilization	NA	$
2	1	Lump Sum	Site Services	NA	$
3	1	Lump Sum	Waste Characterization	NA	$
4	250	Ton	Removal, Transportation and Disposal of Berm Soils as Hazardous Waste	$	$
5	1	Lump Sum	Berm Treatment	NA	$
6	250	Ton	Fill Sand	$	$
7	1	Lump Sum	Berm Reconstruction	NA	$
8	1	Lump Sum	Site Restoration	NA	$
9	1	Lump Sum	Demobilization	NA	$
10	1	Provisionary Allowance	Owner's Allowance	NA	$10,000.00
	TOTAL (This amount should equal the Base Bid amount on the Bid Summary Form)				

Base Bid (Sum of Item Bid Prices for all Base Bid Items):

_____ Dollars $_____

(use words) (in figures)

Schedule of Alternates - The Bidder will complete (or deduct from the Contract) the parts of the Work designated by the Alternates that follow and accept in full payment (or allow in full credit) for those parts of the Work the following Item Bid Prices:

Alternate Item No.	Bid Quantity	Description	Unit Price	Item Bid Price

The Bidder further acknowledges and agrees that the separate prices bid on this "Schedule of Alternates," where they are applicable and deemed acceptable by the **Owner**, will be used if incorporated into the Contract when the **Owner** issues the Notice of Award.

Schedule of Unit Prices or Contingent Change Order Prices - The Bidder shall use this "Schedule" to quote unit prices identified in the bid documents or propose other contingent Change Order prices. The proposed Unit Prices or contingent Change Order prices set forth in this schedule, at the sole discretion of the **Owner,** may, or may not be incorporated into the Contract Documents. The **Owner** reserves the right to negotiate Unit Prices or contingent Change Order prices set forth herein prior to their possible incorporation into the Contract Documents.

Item No.	Bid Quantity	Description	Unit Price	Item Bid Price

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Qualified Disabled Veteran (QDV) Business Representation

'Qualified Disabled Veteran,' means a business entity that is 51% or more owned by one or more veterans with a service-connected disability.

'Qualified Disabled,' means a business entity that is 51% or more owned by one or more with a service-connected disability.

The vendor represents that it IS _____, a qualified disabled veteran.

The contractor represents and warrants that the company meets the above (when checked) and has attached supporting documentation per the following:

Each bid requesting the Qualified Disabled Veterans (QDV) preference, in accordance with Public Act 22 of 2010, MCL 18.1241.3 shall include a DD214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

Fraudulent Certification as a Qualified Disabled Veteran may result in debarment under MCL 18.264.

Certification of a Michigan Based Business

(Information Required Prior to Contract Award for Application of State Reciprocity Provisions)

To qualify as a Michigan Based Business:

Vendor must have, during the 12 months immediately preceding this bid deadline:
or
If the business is newly established, for the period the business has been in existence, it has:

(Check all that apply):

- ☐ Filed a Michigan single business tax return showing a portion, or all the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL 208.1 – 208.145: or
- ☐ Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or
- ☐ Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

- ☐ Bidder qualifies as a Michigan business (provide zip code: _____)
- ☐ Bidder does not qualify as a Michigan business (provide name of State: _____).
- ☐ Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: (_____).

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN $25,000 and subject to debarment under MCL 18.264.

ASBESTOS ABATEMENT ATTESTATION

SUBMISSION REQUIRED WITH ALL BIDS

Pursuant to the Public Entity Asbestos Removal Verification Act, PA 59 of 2024, MCL 338.3371 et seq. ("the Act"), the Owner will conduct the background investigation as required of any asbestos abatement contractor, or a general contractor that contracts with an asbestos abatement contractor, for the abatement of asbestos. Under the Act, an "Asbestos abatement contractor" means a business entity that is licensed under the asbestos abatement contractors licensing act, 1986 PA 135, MCL 338.3101 to 338.3319, and that carries on the business of asbestos abatement on the premises of another business entity and not on the asbestos abatement contractor's premises. Asbestos abatement contractor includes an individual or person with an ownership interest in a business entity described in MCL 338.3373(b).

(INSTRUCTIONS: Professional to select one of these two statements, then *delete* the not selected statement and instructions.)

☐ **THE SCOPE OF WORK TO BE COVERED UNDER THIS CONTRACT CONTAINS ASBESTOS ABATEMENT AND THIS ATTESTATION MUST BE COMPLETED.**

■ **THE SCOPE OF WORK TO BE COVERED UNDER THIS CONTRACT DOES NOT CONTAINS ASBESTOS ABATEMENT AND THIS ATTESTATION IS TO BE LEFT BANK.**

Contractor attests that: *(check one:)*

1. ☐ The Contractor will self-perform all asbestos abatement project work and attests that Contractor has not been issued 5 or more notices of violation of environmental regulations (State and/or Federal), nor has been subject to an administrative consent order or a consent judgment involving environmental regulations.

2. ☐ The Contractor will self-perform all asbestos abatement project work; however, Contractor has been issued 5 or more notices of violation of environmental regulations (State and/or Federal), or has been subject to an administrative consent order or a consent judgment involving environmental regulations, requiring Owner to conduct a background investigation and a public hearing pursuant to PA 59 of 2024, MCL 338.3371 et seq.

3. ☐ The Contractor nominates the following Sub-contractor for all asbestos abatement project work and attests that the nominated Sub-contractor has not been issued 5 or more notices of violation of environmental regulations (State and/or Federal), nor has been subject to an administrative consent order or a consent judgment involving environmental regulations:

   Nominated Sub-contractor: _____

4. ☐ The Contractor nominates the following Sub-contractor for all asbestos abatement project work; however, the nominated Sub-contractor has been issued 5 or more notices of violation of environmental regulations (State and/or Federal), or has been subject to an administrative consent order or a consent judgment involving environmental regulations, requiring Owner to conduct a background investigation and a public hearing pursuant to PA 59 of 2024, MCL 338.3371 et seq.

   Nominated Sub-contractor: _____

BID BOND

BID SUBMITTED ON the _____ day of _____, 20____.

Bid Security **is in the form of a Bid Bond _____ Bid Bond form has been duly executed _____; or**

A Bank Certified or Cashier's check ___ or Money Order ___ is attached to this page ____ (***If Bid Security is by Check or Money Order, the original check or money order must be delivered to the issuing office before Bid Due Time. ALL other SIGMA bid submittals are also still to be made).***

If the Bidder is an Individual:

Name of Individual: _____

Name & Title of Person Authorized to sign: _____

Signature: _____
(If not the Individual, Attach Power of Attorney) Date

Doing Business as: _____

Business Address: _____

County of registration _____

Telephone: _____ FAX: _____

If the Bidder is a Partnership:

By: _____
(True Name of the Partnership)

_____
Partner Authorized to Sign Date

Signature: _____
(Attach evidence of Authority to sign) Date

Business Address: _____

County of registration _____

Telephone: _____ FAX _____

If the Bidder is a Corporation:

By: _____
(Legal Corporation Name)

Name & Title of Authorized Officer: _____

Signature: _____
(Attach evidence of Authority to sign) Date

Name & Title of Officer Attesting: _____

Signature: _____
Date

Business Address: _____

Telephone: _____ FAX _____

(State of Incorporation): _____

If The Bidder is A Joint Venture: JOINT VENTURE SIGNATURES MUST BE AS PROVIDED IN INSTRUCTIONS TO BIDDERS. EACH JOINT VENTURER SIGNING THE BID MUST SIGN IN THE MANNER INDICATED FOR AN INDIVIDUAL, A PARTNERSHIP OR A CORPORATION. IF MORE THAN TWO JOINT VENTURERS OF THE SAME TYPE ARE INCLUDED, USE ADDITIONAL PAGES. JOINT VENTURE STATE OF INCORPORATION _____ OR COUNTY OF REGISTRATION _____

POST-BID SUBMITTALS

The PSC will request this submittal after bid opening. Complete and submit these items within two business days after the request.

BIDDER'S EXPERIENCE MODIFICATION RATING (EMR) _____
Attach letter of explanation if the Bidder does not have an EMR.

PROPOSED PROJECT SUPERINTENDENT _____
Attach brief resume or list of similar successful projects.

LIST OF SIMILAR PROJECTS COMPLETED BY THE BIDDER
Please list at least three completed projects of similar size and complexity to the project being bid, with reference contact information

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

POST BID SUBMITTALS: LIST OF SUBCONTRACTORS

The Apparent Low Bidder shall nominate for each Division of Specification and/or trade category, the Subcontractor to be awarded Sub-agreements, including the apparent Low Bidder if work is to be self-performed. The Apparent Low Bidder will ensure that all Subcontractors have a current State Project Registration in compliance with PA10 of 2023, as amended in PA110 of 2024. Nominated subcontractors shall not be removed, replaced, or added to except by written request for good reason, subject to Owner acceptance. Notwithstanding anything to the contrary, the Owner has the right to object, regardless of cause, to any asbestos abatement Subcontractor nominated by the Contractor to be awarded a Sub-agreement that has 5 or more notices of violation of environmental regulations, or has been subject to an administrative consent order or a consent judgment involving environmental regulations, within the immediately preceding 5 years.

Division, Specification Section and/or Trade	Nominated Subcontractor(s)	Amount of Subcontract
1._____	_____	_____
2._____	_____	_____
3._____	_____	_____
4._____	_____	_____
5._____	_____	_____
6._____	_____	_____
7._____	_____	_____
8._____	_____	_____
9._____	_____	_____
10._____	_____	_____
11._____	_____	_____
12._____	_____	_____
13._____	_____	_____
14._____	_____	_____

The undersigned Apparent Low Bidder _____ certifies that all the information and data furnished in this List of Subcontractors are current, accurate and complete as of the date stated below.

Signed by:_____Name_____ Title _____

on this _____ day of _____, 20_____.

PERFORMANCE BOND

SURETY COMPANY REFERENCE No. _____

That "the **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for _____ _____, "the Work," covered by the Contract Documents, which are incorporated into this Performance Bond by this reference.

If the **Contractor** faithfully performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of the Contract Documents within the Contract Time (including any authorized changes, with or without notice to the Surety) and during the Correction Period, and if the **Contractor** also performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of any and all duly authorized modifications of the Contract Documents, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision) releases the Surety of its obligations under this Section 00610 Performance Bond. The Surety expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision).

B. This Performance Bond must be solely for the protection of the **Owner** and its successors, legal representatives or assigns.

C. It is the intention of the **Contractor** and Surety that they must be bound by all terms and conditions of the Contract Documents (including, but not limited to General Conditions and this Performance Bond). However, this Performance Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Performance Bond is/are illegal, invalid, or unenforceable, all other provisions of this Performance Bond must nevertheless remain in full force and effect, and the **Owner** must be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety must be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign) By:_____

WITNESS _____ Name & Title: _____

Telephone No. _____

THE SURETY: (Print Full Name and Sign) Agent: _____

WITNESS _____ Attorney-in-Fact: _____

Telephone No. _____

Email:. _____

PAYMENT BOND

SURETY COMPANY REFERENCE No._____

"the **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for _____ _____, "the Work," covered by the Contract Documents, which are incorporated into this Payment Bond by this reference.

If the **Contractor** promptly pays all claimants supplying labor or materials to the **Contractor** or to the **Contractor's** Subcontractors in the prosecution of the Work, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. All rights and remedies on this Payment Bond are solely for the protection of all claimants supplying labor and materials to the **Contractor** or the **Contractor's** Subcontractors in the prosecution of the Work and must be determined in accordance with Michigan Law.

B. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision) must release the Surety of its obligations under this Payment Bond. The Surety hereby expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision).

C. It is the intention of the **Contractor** and Surety that they must be bound by all terms and conditions of the Contract Documents (including, but not limited to this Payment Bond). However, this Payment Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Payment Bond is/are illegal, invalid, or unenforceable, all other provisions of this Payment Bond must nevertheless remain in full force and effect, and the **Owner** must be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety must be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign) By:_____

WITNESS _____ Name & Title: _____

Telephone No. _____

THE SURETY: (Print Full Name and Sign) Agent: _____

WITNESS _____ Attorney-in-Fact: _____

Telephone No. _____

Email: _____

DIVISION 00

BIDDING REQUIREMENTS AND CONTRACT CONDITIONS

SECTION 00010 PRE-BID INFORMATION

1. **Invitation to Bid (ITB)** – Your firm is invited to submit a Bid. The State of Michigan as the Owner will receive **bids electronically through the SIGMA VSS website at https://sigma.michigan.gov/webapp/PRDVSS2X1/AltSelfService,** for Fort Custer Small Arms Berm until 2:00 p.m., ET, on April 29, 2026. The State reserves the right to cancel this Invitation to Bid (ITB) or change the date and time for submitting Bids by announcing same at any time before the established date and time for Bid opening. Bids must remain open for acceptance by the Owner for no less than the Bid hold period. Contractor may agree to extend the Bid hold period. However, any such extension must be based upon no increase in the Bid Price and/or Contract Time.

2. **Work Description** – The Work, The goal of the project is to remove and dispose of the lead contaminated soils at the small arms range backstop berm and reconstruct the berm, DTMB File No. 511/26108.SAR includes, but is not necessarily limited to:

    1. Site Services, Mobilization, and Demobilization.
    2. Characterization of the contaminated berm soils.
    3. Remove, transport and dispose of contaminated berm soils.
    4. Reconstruct the berm.
    5. Site restoration.

    The site is located at Fort Custer Training Center, Battle Creek, Michigan, as shown on the Drawings.

3. **Bidding Documents** – Sets of Bidding Documents may be obtained at https://sigma.michigan.gov/webapp/PRDVSS2X1/AltSelfService .

4. **Bid Security** – Each Bid must enclose a duly executed Bid Security, in the amount of five percent (5%) of the Bidder's Base Bid, paid to the "State of Michigan" in the form of a certified or cashier's check or money order drawn upon a bank insured by an agency of the Federal Government, or a bid bond signed by both the Contractor and authorized surety company. *If Bid Security is by check or money order, such certified or cashier's check or money order must be delivered in original copy before the Bid Due Time to:*

    State Facilities Administration
    Design & Construction Division
    3111 W. St. Joseph Street
    Lansing, Michigan 48917

    All other Bid information must be submitted via SIGMA as per standard bidding procedure

5. **Pre-Bid Conference** – A mandatory X voluntary _ pre-bid conference will be held at Berm 5 of the Small Arms Range, Fort Custer Training Center, 1100 Denso Road, Battle Creek, MI 49037, MI on April 21, 2026, at 10:30 AM ET. A tour of the site will X will not _ be held on the same day, starting at immediately following the pre-bid conference. All prospective Bidders are required X encouraged _ to attend the tour, if held. Other parties interested in the Work are encouraged to attend the tour. Addenda may be issued, in response to issues raised at the pre-bid conference and tour, or as the Owner and/or Professional may otherwise consider necessary. An individual is only permitted to represent one bidder at a mandatory Pre-Bid Conference.

    The purpose of the pre-bid conference and inspection is to answer questions and provide an inspection tour of the Project site at the scheduled time on the day of the meeting. A representative will be available to assist the Contractors. Other inspection visits may be allowed if needed. Individuals needing special services to fully participate in the meeting due to a disability may contact Sarat Bobba at sbobba@dlz.com.

    FOR CORRECTIONAL FACILITIES ONLY: All contractor/vendor representatives attending a Pre-Bid Walk Through Meeting must submit a Vender/Contractor LEIN Request five business days prior to the meeting date, (LEIN Request For CAJ-1037 attached to Bid posting). Send the LEIN Request form, filled out and signed, by email to SmithD76@michigan.gov & FrostS1@michigan.gov . The email "Subject" must include (Facility Name, Project Name, Date & Time of Pre-Bid Walk Through Meeting).

6. **SIGMA VENDOR NUMBER:** If you are bidding a State job for the first time, visit the State of Michigan SIGMA website, https://sigma.michigan.gov/webapp/PRDVSS2X1/AltSelfService, and follow the "SOM VSS User Guide for New Vendors" instructions, located under Forms and Reference Documents. Registration is required for bid submission. **Do not wait until the last minute to submit a proposal**, as the SIGMA system requires the creation of an account and entry of certain information, in addition to uploading and submitting the materials. The SIGMA system **will not** allow a proposal to be submitted after the proposal deadline, even if a portion of the proposal has been updated.

    Questions on how to submit information or how to navigate in the SIGMA VSS system can be answered by calling **(517) 373-4111 or (888) 734-9749**.

7. **Equal Employment Opportunity** – Covenants to not discriminate in employment by Contractors, Subcontractors and Suppliers required by Law are contained in Instructions to Bidders and General Conditions and are applicable to the Work and any Sub-agreement under the Contract.

8. **Contract Times** – The Contract Times and the associated liquidated damages are specified in the Contract.
9. **Contact Person** – All requests or inquiries concerning the Bidding Documents, or the Work must be addressed to: Mr. Sarat Bobba via email at sbobba@dlz.com. Questions will be accepted until April 22, 2026 at 2:00 PM ET.

10. **Award** – Subject to any agreed extension of the period for holding Bids, Bids must remain valid for acceptance by the Owner for 60 Calendar Days after the date of Bid opening. In addition, the Owner expressly reserves the right, within the Owner's sole discretion, to reject any or all Bids, to waive any irregularities, to issue post-Bid Addenda and re-bid the Work without re-advertising, to re-advertise for Bids, to withhold the award for any reason the Owner determines and/or to take any other appropriate action.

11. **Performance and Payment Bonds** – A performance bond and a payment bond are required for all contracts over $50,000.00 for the contract award amount.

END OF SECTION 00010

SECTION 00100 INSTRUCTIONS TO BIDDERS

1. **PREPARATION OF BID:** Execute Bid fully and properly. Bid Summary Form (DTMB -0401D) and Bid Form Attachments must be used and completely filled out for the Bid to be considered responsive and meeting the requirements of the contract solicitation. All Bid prices must be printed or typed in both words and figures.

2. **BID CHECKLIST:** Submit Bid Summary Form with original signatures plus Bid Form Attachments in accordance with the electronic bidding procedures on the SIGMA VSS website.

A complete Bid will consist of the following forms, which are included immediately following the Bid Summary Form:

Bids	**SUBMIT THESE Bid Forms and Bid Form Attachments**
All Bids	☐ **Signed** and completed Bid Summary Form (DTMB-0401D).
	☐ Bid Schedule.
	☐ Qualified Disabled Veteran (QDV) Business Representation.
	☐ Bid Security in the amount of 5% of Base Bid Price.

If Bid Security is by check or money order, such certified or cashier's check or money order must be delivered in original copy before the Bid Due Time to:

State Facilities Administration
Design & Construction Division
3111 W. St. Joseph Street
Lansing, Michigan 48917

All other Bid information must be submitted via SIGMA as per standard bidding procedure

	☐ Signature Authorization or copy of the partnership agreement if signed by all partners.
	☐ Byrd Anti-Lobbying Certification (Only when Federal Provisions Addendum is included)
	☐ Asbestos Abatement Attestation
	☐ State Project Registration (SPR) for the Contractor and subcontractors (if applicable pursuant to 2023 PA 10, as amended, MCL 408.1101 et seq.)
	☐ Other Forms; (Hazardous soil removal, transportation and disposal experience, Work experience on military facilities, Project references, Project Schedule, OSHA worker training certificates).
Over $50K	☐ Forms listed under All Bids.
	☐ Payment and Performance Bond (upon issuing the Notice of Award).
Over $100K	☐ Forms listed under All Bids.
	☐ Certification of a Michigan Based Business.

☐ Payment and Performance Bond (upon issuing the Notice of Award).

Over $250K ☐ Forms listed under All Bids.

☐ Certification of a Michigan Based Business.

☐ Payment and Performance Bond (upon issuing the Notice of Award).

Apparent Low Bidders ONLY (upon request from the Professional)

☐ Experience Modification Rating (EMR), or a letter stating why the Bidder does not have one.

☐ Identification of the proposed project superintendent, with a resume or list of similar projects handled by that individual.

☐ A list of at least three (3) projects completed by the Bidder, within the last three (3) years of similar size and complexity, with contact information for references for each.

☐ A list of nominated sub-contractors, including proposed self-performed categories, for each Division/Trade/etc.

3. **BID SUBMISSION**: **Bids must be submitted electronically through the SIGMA VSS website at https://sigma.michigan.gov/webapp/PRDVSS2X1/AltSelfService**.

4. **BID GUARANTEE:** Each proposal must be accompanied by either a bank certified or cashier's check on an open, solvent bank or a bid bond with an authorized surety company (the surety must be listed on the current U.S. Department of the Treasury Circular 570) in the amount of five percent of the base bid payable to the State of Michigan, as a guarantee of good faith. If the successful Bidder fails to furnish satisfactory bonds and insurance within fifteen Calendar Days after Notice of Award, such guarantee must be forfeited to the State as liquidated damages. *If Bid Security is by check or money order, such certified or cashier's check or money order must be delivered in original copy before the Bid Due Time to the Issuing Office.* The bid security, exclusive of bid bonds, of all unsuccessful Bidders will be returned when an award is made or upon substitution of a bid bond. The bid security of the successful Bidder will be returned when the performance bond and labor and material bond are approved.

5. **Left Blank Intentionally**.

6. **MICHIGAN BASED BUSINESS CERTIFICATION**: All Bidders submitting Bids in excess of $100,000.00 must complete the Certification of Michigan Based Business. This information will determine if a Bidder qualifies as a "Michigan" business for purposes of application of reciprocity where applicable.

7. **POST-BID SUBMITTAL: For all projects, the Professional may request a Post-Bid Submittal from the** Apparent Low Bidders. The Apparent Low Bidders must submit to the Professional, within **two** Business Days after receipt of the Professional's request,

   - Experience Modification Rating (EMR), or a letter stating why the Bidder does not have one.
   - Identification of the proposed project superintendent with a resume or list of similar projects managed by that individual.
   - A list of at least three (3) projects completed by the Bidder, within the last three (3) years of similar size and complexity, with contact information for references for each.

   Failure to provide the submittals may disqualify the Bid.

8. **SIGNATURES:** All Bids, notifications, claims, and statements must be signed as follows:

   (a) **Corporations:** Signature of official must be accompanied by a certified copy of the Resolution of the Board of Directors authorizing the individual signing to bind the corporation.
   (b) **Partnerships:** Signature of one partner must be accompanied by a signed copy of the legal document (e.g., Power of Attorney or partnering agreement) authorizing the individual signing to bind all partners. If Bid is signed by all partners, no authorization is required.
   (c) **Individual:** No authorization is needed. Each signature must be witnessed.

9. **BID PRICES:** The Bidder's Base Bid and Alternate Bid prices must include, and payment for completed Work will compensate in full for: all services, obligations, responsibilities, management, supervision, labor, materials, devices, equipment, construction equipment, general conditions, permits, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, supplies, Bonds, insurance, taxes, mobilization, close-out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work, in a

neat, first quality, workmanlike and satisfactory manner in accordance with the Drawings and Specifications and as otherwise required to fulfill the requirements of the Bidding Documents. For each Cash Allowance item, the Bidder must include, within the Bid, all labor costs, construction equipment costs, insurance and Bond premiums and other general conditions costs and Fees (Bidder's and Subcontractors') to complete Work associated with the material, equipment, or other designated item to be furnished under the Cash Allowance. For each Provisionary Allowance, the Bidder must include, within the Bid, insurance, premiums (not recoverable as labor burden) and Bond premiums required to complete Work that may be ordered under a Provisionary Allowance.

10. **INSPECTION OF BIDDING DOCUMENTS AND SITE CONDITIONS:** The Bidder must carefully review and inspect all documents referenced and made part of this ITB, site conditions, all applicable statutes, regulations, ordinances, and resolutions addressing or relating to the goods and services under this contract. Failure to do so or failure to acquire clarifications and answers to any discovered conflicts, ambiguities, errors, or omissions in the Bidding Documents will be at the Bidder's sole risk.

11. **SAFETY REQUIREMENTS AND LAWS:** The Bidder awarded the Contract must comply with all applicable federal, state, and local Laws including health and safety regulations, environmental protection, permits and licensing.

12. **INTERPRETATIONS AND ALTERATIONS TO THE BID AND BIDDING DOCUMENTS:** All requests for clarification or interpretation of the Bidding Documents, all proposals for any modifications to the Bidding Documents, all requests for information and all other questions or inquiries about the Bidding Documents and/or the Work shall be submitted in writing to the Contact Person identified in the Bid Documents. Requests or inquiries received less than seven Calendar Days before the date of Bid opening will be answered only if (a) the response can be given through an Addendum made available at least seventy-two hours before Bid opening (counting Business Days only), (b) the Bid opening is postponed by Addendum, or (c) the Work is rebid without readvertising following the issuance of post-Bid Addenda.

    Bidders must not rely upon any oral statements or conversations regarding interpretations, clarifications, corrections, additions, deletions or other revisions or information to the Bidding Documents. Any addition, limitation or provision made with or attached to the Bid may render it non-responsive and/or irregular and be a cause for rejection. The Owner reserves the right to issue a post-Bid Addendum after opening the Bids and set a new date for the receipt and opening of sealed Bids. The Bidder acknowledges that any quantities of Unit Price Work given in this ITB are approximate only and payments will be made only for actual quantities of Unit Price Work completed in accordance with the Contract Documents.

13. **MODIFICATION OF BID:** The entire bid must be resubmitted on the SIGMA VSS website.

14. **BID WITHDRAWAL:** Except for timely filed claims of mathematical or clerical errors granted by the State, no Bid may be withdrawn within sixty Calendar Days after the Bid Opening time and date or before the Bid expiration date without forfeiting Bid security. The request to withdraw a Bid due to error must be submitted in writing along with the supporting documents within two Business Days after the date of Bid Opening. The claim must describe in detail the error(s), include a signed affidavit stating the facts of the alleged error(s) and request that the Bidder be released from its Bid. The review of the claim and its supporting documents by the State is only for the purpose of evaluating the Bidder's request and must not create duty or liability on the State to discover any other Bid error or mistake. The sole liability of any Bid error or mistake rests with Bidder.

15. **OBJECTION TO THE AWARD:** A Bidder may file a written protest with the Director-DCD to object to the Apparent Low Bidder. This objection must be filed within seven Calendar Days after the date of Bid opening and must describe in detail the basis for the protest and request a determination. The Director-DCD will either dismiss or uphold the protest and notify the protestor within ten Calendar Days after receipt of the written protest.

16. **BID IRREGULARITIES:** The following irregularities on any Bid Form or Bid Form Attachment must be resolved as follows:
    (a) between SIGMA entry and signed Bid Summary attachment, the signed Bid Summary attachment will be used.
    (b) between words and figures, the words must be used.
    (c) between any sum, computed by the Bidder, and the correct sum, the sum computed by the Bidder must be used.
    (d) between the product, computed by the Bidder, of any quantity and Bid Unit Price and the correct product of the Unit Price and the quantity of Unit Price Work, the product extended by the Bidder must be used.
    (e) between a stipulated Allowance and the amount entered, the Allowance must be used.
    (f) any mobilization pay item exceeding the maximum specified must be ignored and the Bid must remain unchanged.
    (g) if any Bidder fails or neglects to bid a Unit Price for an item of Unit Price Work but shows an "Bid Price" for that item, the missing unit price must be computed from the respective quantity and the Item Bid Price shown.
    (h) if any Bidder fails or neglects to show a "Bid Price" for an item of Unit Price Work but bids a unit price, the missing Bid Price must remain as "zero"; and
    (i) if any Bidder fails or neglects to enter a Bid Price in both words and figures, the Bid Price printed or typed, whether in words or figures, must be used.

17. **CERTIFICATION:** The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.
(b) Has not had a felony conviction in any state (including the State of Michigan).
(c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid rigging, or a violation of state or federal anti-trust statutes.
(d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.
(e) Has not been terminated for cause by the Owner.
(f) Has not failed to pay any federal, state, or local taxes.
(g) Has not failed to comply with all requirements for foreign corporations.
(h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.
(i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, that in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:
    1. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
    2. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.
    3. A finding that the bidder failed to pay the wages and/or fringe benefits as required by applicable law.
    4. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
    5. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.
    6. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
    7. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).
(j) Is not an Iran-Linked Business as defined in MCL 129.312.

A false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

18. REJECTION OF BID: The Bidder acknowledges the right of the Owner to reject any Bids and to waive any informality, defects or irregularity in any Bid received. In addition, the Bidder recognizes the right of the Owner to reject a Bid if:
(a) the Bid is in any way incomplete or irregular.
(b) the Bidder, Subcontractor or Supplier is not responsible as determined by the Owner.
(c) the Bidder's performance as a Contractor was unsatisfactory under a prior Contract with the Owner for the construction, repair, modification, or demolition of a facility with the Owner, or under any other Contract, which was funded, directly or indirectly, by the Owner.
(d) there are reasonable grounds for believing that collusion or unlawful agreements exists between any Bidders, that a Bidder is interested in more than one Bid, or that the Bid is not genuine.
(e) the Bid exceeds the funds available.

19. MATERIALS AND EQUIPMENT SUBSTITUTION: Any Bidder wishing to use manufacturers or materials other than those specified must submit a written request to the Professional not later than seven days before due date for Bids. Request must be accompanied by product data to permit evaluation and comparison with specified products or materials. The Person submitting the request will be responsible for its prompt delivery. The Professional and the Owner will examine and evaluate the product data and if found acceptable, an Addendum will be issued and mailed or delivered to each Person who has received a set of Drawings and Specifications. All Addenda issued must be made a part of the Contract requirements. Contractor will be responsible for any extra work and expense incurred to satisfactorily and completely incorporating each substitute product into the Project.

20. MICHIGAN PRODUCTS AND RECYCLED PRODUCTS: All Contractors and Suppliers are encouraged to provide Michigan-made products and/or recycled products and/or green products and/or environmentally friendly products whenever possible where price, quality, and performance are equal to, or superior to, non-Michigan products and the requirements of the Contract Documents. The Contractor will be required to use alternatives to landfills for waste disposal such as reuse or recycle of asphalt, bricks, concrete, masonry, plastics, paint, glass, carpet, metals, wood, drywall, insulation, and any other waste materials to the extent practical.

21. PRE-AWARD PRODUCT SUBMITTALS: If requested, the Apparent Low Bidders must submit a summary of preliminary technical data on each product listed in _NA_____. The Apparent Low Bidders will furnish this summary data to the

Professional within forty-eight hours of the Bid Opening. These submittals will be used to evaluate the Bid before the award. Failure to provide the submittals may disqualify the Bid.

22. CONTRACT AND CONTRACT AWARD: The Owner intends to award a Contract to the responsive and responsible best value bidder, except as provided below relative to veteran's preference.

22.1 Determination of the lowest three Bidders shall be based on the sum of the Base Bid and any additive and deductive Alternates the Owner accepts, in the order in which they are listed only. The Owner will accept an Alternate only if all other previously listed Alternates are also accepted unless acceptance by the Owner of Alternates in a different order does not affect determination of the lowest three bidders in any way.

22.2 The bids will be evaluated for best value based on price and qualitative components by comparing the qualitative components of the three lowest responsive and responsible Bidders. The comparison may also include other Bidders whose bids are within 10% of the lowest responsive and responsible Bidder.

22.3 If a Qualified Disabled Veteran meets the requirements of the contract solicitation, provides acceptable responses to both Part One and Part Two of the Best Value Construction Bidder Evaluation to achieve a Best Value recommendation and with the veteran's preference is the lowest responsive, responsible, best value Bidder, the Owner will award the contract to the Qualified Disabled Veteran bidder. A determination as to whether the requirements of the bid solicitation have been met will be based solely on the Owner's and Professional's evaluation of the Bid Summary, Bid Attachments, Bidder-provided documents, and interview.

22.4 For the purpose of evaluating and determining the low responsive bid, 10% of the lowest responsive bid (the bid that would otherwise receive the contract award if the preference were not being considered) will be deducted from all QDV bids. If the low responsive QDV bid, less the 10% preference, is less than the lowest responsive bid, then the QDV bid will be declared the official low responsive bid. The original QDV bid amount will be the basis of the contract award.

Example:

Lowest Responsive Bid	$100,000
Lowest Responsive QDV Bid	$109,000
Preference (10% of the Lowest Responsive Bid)	$ 10,000
Lowest Responsive QDV Bid Less Preference	$ 99,000 ($109,000 - $10,000)
Official Low Responsive Bid	**$109,000**

22.5 The Apparent Low Bidders will be evaluated for responsiveness and responsibility based on the following:

- Compliance with the bid specifications and requirements.
- The Bidder's financial resources.
- The Bidder's technical capabilities.
- The Bidder's technical experience.
- The Bidder's past performance.
- The Bidder's insurance and bonding capacity.
- The Bidder's business integrity.

Some qualitative components that may be evaluated are:

- Technical approach.
- Quality of proposed personnel.
- Management plans.
- Past performance of any nominated asbestos abatement subcontractor(s).
- Past hazardous soil removal, transportation and disposal experience.
- Past work experience on military facilities.
- Schedule of work performance.

22.6 For contracts under $250,000, best value will primarily be based on the lowest responsive and responsible bid.

23. CONTRACT TIME; LIQUIDATED DAMAGES: Work of all trades as specified in the Contract Documents must be completed in NA calendar days from the date of Notice-to-Proceed or by July 21, 2026 based on Notice-to-Proceed except for minor replacement, correction, or adjustment items which do not interfere with the complete operation and utilization of all parts of the Contract Work. This Contract Time is of the essence and liquidated damages for each Calendar Day that expires after this Substantial Completion of the entire Work must be in the amount of $2,000.

. Liquidated damages are not a penalty, are cumulative and represent a reasonable estimate of the Owner's extra costs and damages, which are difficult to estimate with accuracy in advance.

24. MOBILIZATION: If used in the Specifications/Bid schedule, all the up-front costs incurred by the Contractor must be covered by the mobilization. The costs to establish temporary site offices, to obtain required permits for commencing the Work and for bonds and insurance premiums are examples of costs to the Contractor that are covered by mobilization pay item. This cost must not exceed four percent (4%) of the Base Bid, unless otherwise expressly provided in the Bidding Documents.

25. SOIL EROSION AND SEDIMENTATION CONTROL: All Work under this Contract must meet the storm water management requirements of the Project and comply with the applicable Soil Erosion and Sedimentation Control (SESC) rules and regulations and specific provisions for same within the Contract Documents. SESC measures will be monitored and enforced by the State Facilities Administration, or another authorized enforcing agency if so delegated, through the review of the Contractor's implementation plans and site inspections. State Facilities Administration or the Professional will notify the Contractor in writing of any violation(s) of the applicable SESC statutes and/or the corrective action(s) undertaken by the Owner and may issue stop work orders. State Facilities Administration has the right to assess a fine to the Contractor for noncompliance with the provisions of the Contract Documents and/or SESC regulations applicable to this Work and fines must be in addition to any other remediation costs or liquidated damages applicable to the Project and may exceed the value of the Contract.

26. PREVAILING WAGE: The Bidding Documents include either the attached Appendix V of prevailing rates of wages and fringe benefits for all classes of Construction Mechanics called for in the Bid and resulting Contract, if any, or the attached current prevailing wage determination issued by the U.S. Department of Labor, as applicable depending on the funding source(s).

To the extent 2023 PA 10, as amended, MCL 408.1101 et seq. is applicable, the bid response for a state project must include a copy of the state project registration for the Contractor and for each Subcontractor of the Contractor that has been selected at the time the Contractor submits the Bid.

END OF SECTION 00100

SECTION 00120 SUPPLEMENTARY INSTRUCTIONS

The provisions of this Section amend or supplement Section 00100 Instructions to Bidders and those other provisions of the Bidding Requirements that are indicated below. All other Bidding Requirements that are not so amended or supplemented remain in full force and effect.

The following shall be amended to "**SOIL EROSION AND SEDIMENTATION CONTROL**" Paragraph 25:

The Contractor shall contact MDMVA to obtain necessary permits and comply with applicable regulations. Contractor shall implement appropriate SESC measures to ensure that no sediment leaves the project site. The implementation of the SESC measures is incidental to the project.

END OF SECTION 00120

SECTION 00200 INFORMATION FOR BIDDERS

1. UNDERGROUND UTILITIES

Information or data about physical conditions of existing Underground Utilities, which have been used by the Professional in preparing the Bidding Documents, is shown, or indicated in the Drawings and technical Specifications and those Underground Utility drawings itemized immediately below. none

2. PERMITS, APPROVALS, LICENSES AND FEES

2.1 If the Owner has secured or will secure any permits, approvals and licenses and has paid or will pay any associated charges and fees, any such permits, approvals and licenses are itemized in this paragraph: none

2.2 If any permits, approvals, and licenses itemized above have been obtained by the Owner and the fees have been paid, copies of those permits, approvals, licenses, and corresponding fee receipts, are attached to this Section 00200 Information for Bidders.

Except for any permits, approvals, licenses, and fees identified above, the Contractor shall be responsible for all permits, approvals, licenses, and fees applicable to Work.

3. SEQUENCING REQUIREMENTS

Refer to the technical Specifications, including, but not limited to the General Requirements, for information, data, and criteria on sequences of Work restraints, construction, and maintenance of service to existing facilities, which, if provided, must govern the selection of Work sequences. Each Bidder must be responsible for any conclusions or interpretations the Bidder makes related to the selection of sequences and Means and Methods, based on the technical data made available, and/or those additional investigations or studies made or obtained by that Bidder. none

4. SUBSURFACE CONDITIONS

In preparing the bidding documents, the PSC used the reports of explorations and tests of subsurface conditions itemized immediately below. none

4.1 Information or data contained in those reports that may be properly considered Authorized Technical Data concerning subsurface conditions include (NOTE: All other information or data excluded from the list below represent Non-Technical Information or Data, interpretations, or opinions): none

4.2 In preparing the bidding documents, the PSC has not used the following reports of explorations and tests of subsurface conditions itemized immediately below. none

5. OTHER PHYSICAL CONDITIONS

5.1 The Drawings and technical Specifications and those drawings itemized immediately below contain information or data that have been used in the preparation of the Bidding Documents, and that may be properly considered Authorized Technical Data concerning physical conditions of existing surface and subsurface facilities. none

5.2 The reference documents itemized immediately below have not been used in the preparation of the Bidding Documents and are available for review or purchase. Information and data contained in those reference documents, including, but not limited to dimensions, locations and conditions of existing surface and subsurface structures, roadways, piping, raceways, equipment, etc. may not accurately or reliably reflect actual conditions. Neither the Owner nor Professional warrants that this list identifies all existing relevant documents. none

END OF SECTION 00200

SECTION 00700 GENERAL CONDITIONS

1. Interpretations: Any requests for clarifications or interpretations of the Contract Documents must be in writing to the Professional, who will issue written clarifications or interpretations as appropriate. If the Contractor believes that such clarification or interpretation justifies an adjustment to the Contract Price/Time, the Contractor must promptly notify the Professional in writing before proceeding with the Work Involved.

1.1 **Standards**: The Contract Documents describe the entire Work. The provisions of the Contract Documents must govern over any standard specifications, manual or code of any technical society, organization, or association but, if lower than the standards set by any Law applicable to the Work or the Project, the higher standards must govern. The Contractor's responsibilities extend to cover Subcontractors and Suppliers if liable as a result of their actions or obligations.

1.2 **Contract Time Computation**: The time to complete the Work must be made in Calendar Days and must include both the first and last day. The first day is established by the Notice-to-Proceed.

1.3 **Technical Specifications and Priority:** The following applies whenever priority is called for in Contract Documents: specifications must govern Drawings; figured dimensions must govern scaled dimensions; detail drawings must govern general drawings; Drawings must govern Submittals.

1.4 **Indemnification:** The Contractor is required to defend, indemnify and hold harmless the Owner and the Professional, their employees, agents, servants, and representatives from and against all claims, suits, demands, actions of whatever type and nature and all judgments, costs, losses and damages, whether direct, indirect or consequential including, but not limited to, charges of architects, engineers, attorneys and others and all court, hearing and any other dispute resolution costs arising from:

(a) any patent or copyright infringement by the Contractor.
(b) any damage to the premises or adjacent lands, areas, properties, facilities, rights-of-way, and easements, including loss of use to the business and property of others as a result of Contractor's operations.

(c) any bodily injury, sickness, disease or death, or injury to or destruction of property, including loss of use due to or related to the Work and caused in whole or in part by the Contractor or Subcontractor or Supplier's negligence, omissions, or failure to maintain the required insurance and coverage and,
(d) a failure by the Contractor to appropriately handle Hazardous Materials for the Work or the Contractor's operations in compliance with the Owner requirements and/or applicable Laws and regulations.

The indemnification obligations are not affected by the limitation on the amount and types of damages, compensation or benefits payable by or for the Contractor or Subcontractor or Supplier under worker's or workman's compensation acts, disability benefit acts or other employee benefit acts.

1.5 **Contract Documents Ownership:** The State is the owner of the Contract Documents. The Contractor, Subcontractor or Supplier must not reuse any of the documents on any other Project without prior consent of the State and Professional. The Professional will furnish on behalf of the Owner at no cost to the Contractor, one (1) electronic copy of the Drawings and Project Manual. If the **Contractor**, or the Contractor's Subcontractors or Suppliers request hard copy sets, reproduction of these documents will be the responsibility of the **Contractor**.

2. GENERAL PROVISIONS

2.1 **Owner:** The Project Director and/or Owner Field Representative will represent the Owner. Neither the Project Director nor the Owner Field Representative has the authority to interpret the requirements of the Contract Documents or to authorize any changes in the Work or any adjustment in Contract Price/Time. The State will provide the necessary easements for permanent structure and permanent changes in existing lands, areas, properties, and facilities. However, the Contractor must obtain, at no increase in Contract Price/Time, permits for any other lands, areas, properties, facilities, rights-of-way, and easements required by the Contractor for temporary facilities, storage, disposal of soil or waste material or any other purpose. The Contractor must submit copies of the permits and written agreements to the Owner. The Contractor must engage a registered land surveyor to establish the necessary reference points and/or base lines for construction and must be responsible for protecting them including benchmarks and Project elevations.

2.2 **Professional:** Acting as the Owner's representative during the Contract Time period, the Professional will endeavor to guard the Owner from Defective work and to keep the Owner informed of the progress of the Work. Unless delegated by specific written notice from the Owner, the Professional and the Professional's representatives do not have the authority to authorize any changes in the Work or any adjustment in Contract Price/Time. The On-site Inspections by the Owner Field Representative and/or the Professional do not relieve the Contractor from its obligation to provide the Work in accordance with the Contract Documents or represent acceptance of Defective Work.

2.3 **Contractor:** The Contractor must manage, supervise, and direct the Work competently, applying the management, supervision, skills, expertise, scheduling, coordination, and attention necessary to provide the Work in accordance with the Contract Documents with a minimum disturbance to or interference to the business operations on site or adjacent properties. The Contractor must assign and maintain a competent full-time **superintendent** on the Work, as its representative, at all times while Work is being done on site and must not be replaced without the Owner's consent. The DTMB Superintendent Designation form must be completed by the Contractor and submitted before beginning any work. The Contractor shall enforce good order among its employees and shall not employ on the work any disorderly, intemperate, or unfit persons, or not skilled in the work assigned to them. The Contractor is solely responsible for his Means and Methods, safety precautions and programs related to safety, the Contractor's failure to execute the Work in accordance with the Contract Documents and any act of omissions by the Contractor, Subcontractor or Supplier. The Contractor must **compare Contract Documents for conflicts**, unworkable or unsafe specified Means and Methods and verify against manufacturer's recommendations for installations and handling and must notify the Professional in writing of the discovery of any such conflicts or errors. The Contractor is required to furnish certifications that lines and grades for all concrete work were checked before and after placing concrete, and that final grades are as required by the Contractor Documents. Wherever required, the Contractor must be responsible for all cutting, fitting, drilling, fixing-up, and patching of concrete, masonry, gypsum board, piping and other materials that may be necessary to make in-place Work and dependent Work fit together properly. The Contractor must restore to pre-existing conditions all walks, roadways, paved or landscaped areas and other real and personal property not designated for alteration by the Contract Documents. The Contractor must maintain at the site one copy of safety data sheets (SDS) and one copy of all **as built/Record Documents** in good order and annotated in a neat and legible manner to show:

(a) all revisions made,
(b) dimensions noted during the furnishing and performance of the Work, and
(c) all deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

The Contractor must maintain and furnish promptly to the Owner and the Professional upon their request **daily field reports and photos** recording the on-site labor force and equipment (Contractor and Subcontractors); materials/equipment received; visits by Suppliers; significant in-progress and completed trade Work within major areas; and other pertinent information. The

Contractor is obligated to act to prevent threatened damage, death, injury, or loss without any special instruction in **emergencies** and must give the Owner prompt written notice of any changes in Work resulting from the action taken for review and approval.

2.4 **Subcontractors and Suppliers:** The Owner assumes no contractual obligations to anyone other than the Contractor. All trade construction Drawings must be field coordinated before fabrication and/or installation. The Owner reserves the right to reject or revoke, for its convenience, any approved Subcontractor/Supplier. For any projects with asbestos abatement, Contractor must comply with MCL 338.3375(4) and complete the Asbestos Abatement Attestation. Work performed by any Subcontractor or Supplier must be through an appropriate written agreement that:

(a) expressly binds the Subcontractor/Supplier to the requirements of the Contract Documents,
(b) requires such Subcontractor or Supplier to assume toward the Contractor all the obligations that the Contractor assumes toward the Owner and the Professional, and
(c) contains the waiver of rights and dispute resolution provisions.

2.5 **Prevailing Wages and Access to Payroll Records:**

2.5.1 **Prevailing Wages:**

To the extent applicable, Contractor will comply with federal and state prevailing wage requirements. The wage and classification schedules applicable for this project/location are included in Appendix V.

Federal Prevailing Wages - If a project is funded in whole or in part by federal dollars, the Contractor and all Subcontractors must comply with the most recent version of Federal Provisions Addendum and all Laws pertaining to occupational classifications and wage requirements as follows:

1. FEDERAL PROVISIONS ADDENDUM

    a. The most current version of Federal Provisions Addendum shall apply to this contract and is included at the end of this section and/or Appendix V.

2. DAVIS BACON ACT WAGE AND CLASSIFICATIONS

    a. If applicable, the Contractor (and its Subcontractors) for prime construction contracts in excess of $2,000 must comply with the Davis-Bacon Act (40 USC 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”).

    b. The Contractor (and its Subcontractors) shall pay all mechanics and laborers employed directly on the site of the work, unconditionally and at least once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and the laborers and mechanics.

    c. The Contractor will post the scale of wages to be paid in a prominent and easily accessible place at the site of the work.

    d. There may be withheld from the Contractor so much of accrued payments as the contracting officer considers necessary to pay to laborers and mechanics employed by the Contractor or any Subcontractor on the work the difference between the rates of wages required by the Contract to be paid laborers and mechanics on the work and the rates of wages received by the laborers and mechanics and not refunded to the Contractor or Subcontractors or their agents.

    e. The Contractor shall maintain payrolls and basic records relating thereto for a period of three (3) years after the project; contractor shall submit Certified Payroll Reports using US Department of Labor Wage and Hour Division Form WH-347 for each weekly payroll to support and document compliance with the Davis Bacon Wage rates.

    f. Davis Bacon wage and classification schedules applicable for this project/location are included at the end of this section and/or Appendix V.

State Prevailing Wages -The following provisions apply when 2023 PA 10, as amended, MCL 408.1101 et seq. applies.

Prevailing Wage and Fringe Benefits--The rates of wages and fringe benefits to be paid to each class of Construction Mechanic by DB Entity and Subcontractors must not be less than the wage and fringe benefit rates prevailing in the locality in which the work is performed.

Nondiscrimination, Nonretaliation- Contractor or a Subcontractor shall not discharge, discipline, retaliate against, or otherwise discriminate against a Construction Mechanic, or threaten to do any of these things, because the Construction Mechanic reported or was about to report a violation or suspected violation of the act.

Construction Mechanics under this Contract are intended beneficiaries of the contractual prevailing wage, fringe benefit, and nondiscrimination nonretaliation requirements of the Contract. Any such Construction Mechanic aggrieved by failure of a contractor or subcontractor to pay prevailing wages or benefits as specified in the Contract, or by violation of section 7 of 2023 PA 10, in addition to any other remedies provided by law, may bring an action in a court of competent jurisdiction against such contractor or subcontractor for damages or injunctive relief and may be awarded reinstatement or other appropriate relief, and all damages sustained, together with actual costs and attorney fees at trial and on appeal.

Contractor and Subcontractors shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in this Contract and shall keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each Construction Mechanic employed by it in connection with the Contract. This record shall be available for reasonable inspection by the State.

Contractor must immediately notify the Owner if Contractor's state project registration or a Subcontractor's state project registration is no longer valid (i.e. suspended, revoked or not renewed) at any time during the term of the Contract.

Contractor is to submit certified payrolls, including contractor and subcontractor, not later than 10-days after the end of a pay period to the Department of Labor and Economic Opportunity database via the internet through the Online Certified Payroll Submission process the Contractor signed up for to receive their State Project Registration, 2023 PA 10 as amended, MCL 408.1122. State certified payroll is not to be submitted to DTMB at any time.

2.5.2 **Access to Payroll Records:** The Contractor and its Subcontractors must maintain and keep, in accordance with generally accepted accounting principles, records pertaining to the bidding, award and performance of the Work, including, but not limited to certified payroll, employment records and all data used in estimating the Contractor's prices for the Bid, Change Order, proposal or claim. The Owner or its representative must have access to those records, must have the right to interview the Contractor's employees and must be provided with appropriate facilities for the purpose of inspection, audit/review and copying for five years after final payment, termination, or date of final resolution of any dispute, litigation, audit exception or appeal. The certified payroll and other employment records of workers assigned to the site must contain the name and address of each worker, correct wage classification, rate of pay, daily and weekly number of hours worked, deduction made, and actual wages paid. The Contractor must maintain records that show: (a) the anticipated costs or actual costs incurred in providing such benefits, (b) that commitment to provide such benefits is enforceable, and (c) that the plan or program is financially responsible and has been communicated in writing to the workers affected.

2.6 **Asbestos Abatement Projects:** For projects with Asbestos Abatement, the Contractor must comply with PA 59 of 2024, MCL 338.3371 et seq. as applicable and with APPENDIX III – ASBESTOS ABATEMENT PROJECT PROCEDURES as part of and in conjunction with all other contract requirements.

3. Bonds and Insurance:

3.1 Both the Performance Bond and Payment Bond must remain in effect from the date of Contract Award until final completion of the Work or the end of Correction Period, whichever comes later. The surety bonds required for a Construction Contract will not be accepted by SFA unless the surety bonding company is listed in the current United States Government, Department of Treasury's, Listing of approved sureties (bonding/insurance companies), Department Circular 570. Copies of the current Circular listing may be obtained through the internet web site https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570.htm.

Insurers must have an "A-" A.M. Best Company Rating and a Class VII or better financial size category as shown in the most current A.M. Best Company ratings. Insurance must be provided by insurers authorized by the Department of Insurance and Financial Services (DIFS) to do business as an insurer in Michigan. The insurance company and must attach evidence of the authorization. These certificates must specify the Project File No., Project Title, and a description of the Project. The Contractor agrees that insurance coverage afforded under the policies as such coverage relate to the State under this Contract as determined by the Contractor will not be modified or canceled without at least thirty calendar days prior written notice to the State. The latest A.M. Best's Key Ratings Guide and the A.M. Best's Company Reports (which include the A.M. Best's Ratings) are found at: http://www.ambest.com. The Contractor must not perform any part of the Work unless the Contractor has all the required insurance in full force and effect.

3.2 The Contractor is required to provide proof of the minimum levels of insurance coverage as indicated below. The purpose of this coverage must be to protect the State from claims which may arise out of or result from the Contractor's performance of services under the terms of this Contract, whether such services are performed by the Contractor, or by any subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

The Contractor waives all rights against the State for recovery of damages to the extent these damages are covered by the insurance policies the Contractor is required to maintain pursuant to this Contract. The Contractor also agrees to provide evidence that all applicable insurance policies contain a waiver of subrogation by the insurance company.

All insurance coverages provided relative to this Contract is PRIMARY and NON-CONTRIBUTING to any comparable liability insurance (including self-insurances) carried by the State.

The Insurance must be written for not less than any minimum coverage herein specified or required by law, whichever is greater. All deductible amounts for any of the required policies are subject to approval by the State.

The State reserves the right to reject insurance written by an insurer the State deems unacceptable.

BEFORE THE CONTRACT IS SIGNED BY BOTH PARTIES, THE CONTRACTOR MUST FURNISH TO THE DIRECTOR-DCD CERTIFICATE(S) OF INSURANCE VERIFYING INSURANCE COVERAGE. THE CERTIFICATE MUST BE ON THE STANDARD "ACCORD" FORM. THE CONTRACT NUMBER MUST BE SHOWN ON THE CERTIFICATE OF INSURANCE TO ASSURE CORRECT FILING. All such Certificate(s) are to be prepared by the Insurance Provider and not by the Contractor. All such Certificate(s) must contain a provision indicating that coverages afforded under the policies WILL NOT BE CANCELLED, MATERIALLY CHANGED, OR NOT RENEWED without THIRTY days prior written notice, except for 10 days for non-payment of premium, having been given to the Director-DCD Such NOTICE must include the CONTRACT NUMBER affected and be mailed to the Project Director.

The Contractor is required to provide the type and amount of insurance below:

(a) Commercial General Liability Insurance with a limit of not less than $1,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it must apply separately to this project.

The Contractor must list the State, its departments, divisions, agencies, offices, commissions, officers, employees, and agents as ADDITIONAL INSUREDS on the Commercial General Liability policy.

(b) Vehicle Liability Insurance for bodily injury and property damage as required by law on any auto including owned, hired, and non-owed vehicles used in the Contractor's business.

The Contractor must list the State, its departments, divisions, agencies, offices, commissions, officers, employers, and agents as ADDITIONAL INSUREDS on the vehicle liability policy.

(c) Worker's disability compensation, disability benefit or other similar employee benefit act with minimum statutory limits.

NOTE:

(i) If coverage is provided by a State fund or if Contractor has qualified as a self-insurer, separate certification must be furnished that coverage is in the state fund or that Contractor has approval to be a self-insurer.
(ii) Any citing of a policy of insurance must include a listing of the States where that policy's coverage is applicable; and
(iii) This provision must not be applicable where prohibited or limited by Michigan law.

(d) Employer's Liability Insurance with the following minimum limits:

$1,000,000 each accident
$1,000,000 each employee by disease
$1,000,000 aggregate disease

(e) Pollution Liability Insurance in the amounts of not less than $1,000,000 per occurrence is required.

3.3 **Liability Insurance:** Liability insurance must be endorsed to list as additional insureds the Professional's consultants and agents. Worker's Compensation, Employer's Liability Insurance and all other liability insurance policies must be endorsed to include a waiver of rights to recover from the Owner, Professional and the other additional insureds. The Contractor's liability insurance must remain in effect through the Correction Period and through any special correction periods. For any employee of the Contractor who is resident of and hired in Michigan, the Contractor must have insurance for benefits payable under Michigan's Worker's Compensation Law. For any other employee protected by Worker's Compensation Laws of any other state, the

Contractor must have insurance or participate in a mandatory state fund, where applicable, to cover the benefits payable to any such employee. These requirements must not be construed to limit the liability of the Contractor or its insurers. The Owner does not represent that the specified coverage or limits of insurance are sufficient to protect the Contractor's interests or liabilities.

3.4 **Builder's Risk Insurance:** Unless indicated otherwise in the bid document, the Contractor must purchase and maintain property insurance for 100% of the replacement cost value of the insurable Work (minimum amount to be the contract award amount) while in the course of construction, including foundations, additions, attachments, and all fixtures, machinery and equipment belonging to and constituting a permanent part of the building structures. The property insurance must cover temporary structures, materials and supplies to be used in completing the Work, whether stored offsite, in-transit, or on the building site premises. The property insurance insures the interests of the Owner, Contractor and all Subcontractors and Suppliers at any tier as their interest may appear and name the Owner as Loss Payee. The property insurance insures against "all risk" of physical loss or damage to the extent usually provided in policy forms of insurers authorized to transact this insurance in Michigan. A copy of the master insurance policy must be available for review by the State, upon request. The deductible amount and the payment of any deductible is the responsibility of the **Contractor**.

3.5 The Owner and Contractor intend that the required policies of property insurance must protect all the parties insured and provide primary coverage for all losses and damages caused by the perils covered. Accordingly, to the extent that the insurance company pays claims, the Owner and the Contractor and its Subcontractors/Suppliers waive all rights against each other for any such losses and damages and waive all such rights against the Professional and all other persons named as insureds or additional insureds.

4. Prosecutions; Substantial Completion:

4.1 The Contractor must not start the Work at the site before the first day established by the Notice to Proceed and/or before all insurance is in effect. A pre-construction conference will be held with the Contractor to review its Progress Schedule, qualifications of its key personnel, its proposed access to the site, traffic and parking, procedures for submittal, change orders, etc., and to exchange emergency contact information. The Contractor must use its accepted Progress Schedule when making proposals or claims for adjustment in Contract Time/Price.

4.2 Except in an Emergency, all Work at the site must take place during normal working hours; 6:00 AM to 6:00 PM, during Business Days and in accordance with the special working conditions for the Agency. If the Contract Documents allow work outside the normal hours, the Contractor must provide a written notice to the Owner twenty-four hours before performing such Work and must reimburse the Owner any related increase in the costs incurred by the Owner such as overtime charges of the Professional and payments for custodial and security personnel.

4.3 If, upon inspection and completion of all pre-requisite testing of the Work, the Contractor considers that a portion of the work or all the Work is substantially completed, it must provide a list of items to be corrected or completed to the Owner and the Professional for joint inspection. Within ten Calendar Days of this joint inspection, the Professional will deliver to the Owner and Contractor a list of incomplete/Defective work or a Certificate of Substantial Completion with a Punch List. The certificate must:

(a) fix a reasonable date of Substantial Completion,
(b) fix a date for completion of the Punch List, and
(c) recommend the division of responsibilities between the Owner and Contractor for utilities, security, safety, insurance, maintenance, etc.

Upon issuing the Certificate of Substantial Completion, the Owner will pay for the completed Work subject to (a) withholding of two hundred percent of the value of any uncompleted Work, as determined by the Professional, and (b) any other deductions as the Professional may recommend or may withhold to cover Defective work, liquidated damages and the fair value of any other items entitling the Owner to a withholding. Prerequisites for Substantial Completion, over and above the extent of Work completion required, include (a) receipt by the **Owner** of operating and maintenance documentation, (b) all systems have been successfully tested and demonstrated by the **Contractor** for their intended use, and (c) the **Owner** having received all required certifications and/or occupancy approvals from the State and those Political Subdivisions having jurisdiction over the Work. Receipt of all certifications and/or occupancy approvals from those Political Subdivisions with jurisdiction in and of itself does not necessarily connote Substantial Completion. The Contractor must provide all related operating and maintenance (O&M) documentation to the Owner before training if training is required and not later than Substantial Completion otherwise. The Contractor must give the Owner the final O&M documentation (with revisions made after Substantial Completion) before the request for final payment.

4.4 The Owner may decide to use, at its sole option, any functioning portion of the Work and will inform the Contractor in writing of the decision. The portion of Work to be used must be jointly inspected to determine the extent of completion if it has not undergone the inspection for Substantial Completion. The Professional must prepare a list of items to be corrected/completed and the Owner will allow the Contractor reasonable access to correct/complete the listed items and finish other work.

5. Warranty; Tests, Inspections and Approvals; Corrections of Work:

5.1 **Warranty:** The Contractor must furnish the State with a written guarantee to remedy any defects due to faulty materials or labor which appear in the Work within one year from the date of final acceptance by the State. This warranty excludes defect or damage caused by (a) abuse, modification by others, insufficient or improper operation or maintenance, or (b) normal wear and tear under normal usage. Manufacturer warranties for materials and equipment received by the Contractor must be assigned and promptly delivered to the Owner at Substantial Completion. The warranties period starts from the date of the substantial completion and must be in full force and effect for the entire duration of the Correction Period.

Roof Warranty: For roofing systems, the following warranties are required as minimum:

(a) A two-year contractor's warranty against any defects due to faulty materials or labor.
(b) A fifteen-year manufacturer's total system warranty; and
(c) A twenty-year membrane/shingles/tiles warranty.

5.2 **Tests, Inspections and Approvals:** The Owner will perform or retain a professional/agency to perform inspections, tests or approvals for those materials required to meet quality control standards specified in the Contract Documents except for those inspections, tests or approvals specifically designated to the Contractor in the Contract Documents. However, the Contractor must assume full responsibility for any testing, inspection, or approval.

(a) required to meet code requirements, as promulgated by code inspecting authorities.
(b) required by Law.
(c) indicated or required by the Contract Documents as designated to the Contractor.
(d) required for the Professional's acceptance of a Supplier, materials or equipment or mix designs submitted for prior approval by the Contractor; or
(e) Defective work, including an appropriate portion of the Delay and costs occasioned by discovery of Defective work. The Contractor must (a) pay all related costs; (b) schedule related activities; and (c) secure and furnish to the Professional the required certificates of inspection, testing or approval. The Contractor must provide proper and safe access to the site for inspection, testing or approval. The Contractor must provide the Professional a timely notice whenever any Work is ready for inspection, testing or approval. If the Contractor covers any Work without proper approval by the Professional as required by the Contract Documents, the Contractor must, at its own expense, uncover, expose, or otherwise make available, when requested by the Professional or Owner, for testing, inspection, or approval of the covered Work.

5.3 **Correction of Work:** If any testing, inspection, or approval reveals Defective Work and the Work is rejected by the Professional, the Contractor, at its sole expense, must promptly, as directed, correct, or remove the Defective Work from the site and replace it with non-Defective Work within the Correction Period. The Contractor must bear responsibility for its proportionate share of the Delay and costs resulting from the correction and/or removal and replacement of Defective Work. If the Contractor, within reasonable and agreed upon time after receipt of written notice, (a) fails to correct Defective Work or remove and replace rejected Work, or (b) fails to correct or complete items on any Punch List, or (c) fails to perform Work in accordance with the Contract Documents, or (d) fails to comply with any other provision of the Contract Documents, the Owner, directly or through others, after seven Calendar Days from the date of the written notice to the Contractor, may correct and remedy the Defective Work. To the extent necessary to correct and remedy such Defective Work, the Owner must be allowed to exclude the Contractor from all or part of the site; take possession of all or part of the Work and stop related operations of the Contractor; take possession of the Contractor's tools, plant and office and construction equipment at the site; and incorporate into the Work materials and equipment for which the Owner has paid the Contractor. The Contractor must allow the Owner and the Professional easy access to the site to correct such Defective Work. The Owner must be entitled to an appropriate decrease in Contract Price for all claims, costs, losses, damages, and Delay incurred or sustained by the Owner which are attributable to the Contractor. Such costs may include, but not limited to, costs of correction or removal and replacement of Defective Work, costs of repair and replacement of other work destroyed or damaged by the action and related charges of the Professional. If the discovery of the Defective Work takes place after final payment and the Contractor fails to correct and pay the Owner any of these costs, the Owner must demand due performance under the Performance Bond. Until the period of limitation provided by Michigan Law, the Contractor must promptly, and upon receipt of written notice from the Owner, correct Defective Work. In the event of an Emergency or unacceptable risk of loss or damage or if appropriate under the circumstances, the Owner, directly or through others under contract with the Owner, may correct or remove and replace the Defective Work. The specified correction of Work requirements has no limitation on the rights of the Owner to have Defective Work corrected or removed and replaced, if rejected, except as otherwise provided by the Michigan Law.

5.4 **Special Correction Period Requirements:** Whenever the Owner undertakes any portion of the Work because the Contractor's act or omission Delays completion of the Work or it is eligible for Partial Use, the warranties for all materials and equipment incorporated into that portion of the Work must remain in full force and effect between the start of such Partial Use and the date when the Correction Period starts. The Correction Period for any Defective Work that is corrected or rejected and replaced within the last three months of the Correction Period must be extended by an additional six months, starting on the date such Work was made non-Defective.

5.5 **Special Maintenance Requirements:** If the Contract Documents specify that the entire Work, or a portion of the Work, upon reaching Substantial Completion, must not be placed in use by the Owner, the Contractor must maintain the Work, or specified

part of the Work, in good order and proper working condition and must take all other actions necessary for its protection between the certified date of Substantial Completion and the date when the Work, or designated part of the Work, is placed in use. If no separate price for such special maintenance period was requested and made part of the Contract Documents, the Owner will amend the Contract Documents to appropriately increase the Contract Price.

6. Changes:

6.1 **Changes in the Work:** The Owner may, at any time, without notice to sureties, make any changes bilaterally or unilaterally, by a written Change Order, in the Work within the general scope of the Contract, including but not limited to changes in the Specifications, materials, or Contract Time. In a bilateral change order, the Owner may direct the Professional to prepare a Bulletin describing the change being considered. Upon receiving the Bulletin, the Contractor establishes the cost and returns it to the Professional for review within 15 calendar days. The Contractor's proposal must be irrevocable for 60 Calendar Days after it is submitted to the Professional. If the Professional recommends acceptance of the Bulletin and the Owner agrees with the changes, the Owner issues a written bilateral Contract Change Order to amend the Contract Documents. However, the Owner may issue a unilateral Change Order if the Owner and Contractor are unable to agree on the adjustment in Contract Price or Time. If the Contractor disagrees with such unilateral Contract Change Order, the Contractor must complete the Work and may deliver notice of a claim in accordance with the claim submittal process.

6.2 Differing Site Condition: The Owner does not warrant that any technical data, including the Project reference points, provided by the Owner is necessarily sufficient and complete for the purpose of selecting Means and Methods, initiating, maintaining, and supervising safety precautions and programs or discharging any other obligation assumed by the Contractor under the Contract Documents. If different or unknown site conditions are discovered, the Contractor must notify the Owner in writing before the conditions are disturbed or before proceeding with the affected Work. Upon review, if the Owner decides to agree with the differing site conditions, with the Professional's advice, the Owner may issue a written Contract Change Order to amend the Contract Price or Time through the Bulletin authorization process. If the Owner decides to disagree with the Contractor and the Contractor disagrees with the Owner's decision, the Contractor must complete the Work and may deliver notice of a claim in accordance with the claim submittal process. No proposal or claim by the Contractor due to differing site conditions will be allowed (a) if the Contractor knew of their existence before submitting its Bid or if those conditions could have been discovered by any reasonable examinations for which the Contractor, as Bidder, was made responsible under the Bidding Requirements and/or (b) unless the Contractor's written notice is provided within not more than 21 days after the contractor first recognizes the condition giving rise to the proposal or claim and gives the Owner adequate opportunity to investigate the asserted differing site conditions. A full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with the initial notice shall be delivered to the Professional and Owner within 15 days of the notice, unless otherwise agreed in writing, by the Owner prior to expiration of such time.

6.3 Responsibilities for Underground Utilities: The Contractor must comply with the 2013 PA 174, as amended, MCL 460.721 et seq., and all other Laws concerning Underground Utilities. Before performing site Work, all Underground Utilities, lines, and cables (public and private) must be located and marked. The Contractor must notify MISS DIG to locate and mark utilities on properties that are not State properties. In addition, the Contractor must be responsible for immediately notifying the Owner of any contact with or damage to Underground Utilities, and for the safety, protection of and repairing any damage done to any Work, surface, and subsurface facilities. If the Contractor encounters Underground Utilities that inaccurately located by the Contract Documents or not previously located/marked, which could not be reasonably have been seen, the Owner may issue a written Contract Change Order to amend the Contract Price or Time through the Bulletin authorization process.

6.4 Hazardous Material Conditions: If the Contractor encounters material reasonably believed to be Hazardous Material, which was not described in the Drawings and/or Specifications and was not generated or brought to the site by the Contractor, the Contractor shall immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions in accordance with all federal, state, and local laws. Upon receipt of the notice, the Owner will investigate the conditions and (a) may stop the Work and terminate the affected Work or the Contract for convenience; (b) may contract others to have the Hazardous Material removed or rendered harmless or (c) issue a written Contract Change Order to amend the Contract Price/Time through the Bulletin authorization process. If the Hazardous Material is brought to site by the Contractor or as a result in whole or in part from any of its violation of any Law covering the use, handling, storage, disposal of, processing, transport and transfer or from any other act or omission within its control, the Contractor is responsible for the Delay and costs to clean up the site, remove and render harmless the Hazardous Material to the satisfaction of the Owner, State and all Political Subdivisions with jurisdiction.

6.5 Incidents with Archaeological Features: The Contractor must immediately notify the Owner in writing of any Archeological Feature deposits encountered at the site and must protect the deposits in a satisfactory manner. If the Contractor encounters such features, which result in an anticipated change to the Contract Price/Time, the Owner may issue a written Contract Change Order through the Bulletin authorization process.

6.6 Unit Price Work: Quantities as listed have been carefully estimated but are not guaranteed. The Owner reserves the right to increase or decrease the quantities of the Work to be performed at the Unit Price by amounts up to 20 percent of the listed estimated quantities. For Unit Price Work, the Contractor must promptly inform the Professional in writing if actual quantities

differ from the estimated quantities for any item. For quantities over 120% or below 80% of the estimated quantity, the Owner may negotiate a Unit Price with the Contractor, or direct a unilateral change, or bid that Work under separate contract. Any adjusted Unit Price agreed upon by the Owner will only apply to the actual quantities above 120% or below 80% of the estimated quantity. No adjustment due to quantity variations must be allowed (a) unless the Contractor met the notice requirements, or (b) if any Unit Price increase results in whole or in part from any act or omission within the control of the Contractor (errors in the Contractor's Bid, unbalanced Unit Prices, etc.). If a dispute arises between the Owner and the Contractor on the adjusted Unit Price, the Contractor must carry on the Work with due diligence during the disputes/disagreements.

6.7 Cash Allowances; Provisionary Allowances: The Contractor must obtain the Professional's and Project Director's written acceptance before providing materials, equipment, or other items covered by Cash Allowance. Work authorized under any Provisionary Allowance may consist of (a) changes required by actual conditions, as determined by the **Professional**, and (b) any other Work authorized and completed under the pertinent provisions of the Contract Documents.

6.8 Changes in Contract Price:

6.8.1 The Contractor's proposals or claims for Work Involved must detail all affected items of Work, whether increased, revised, added, or deleted, and must be fully documented and itemized as to (a) individual adds and deducts in Work quantities and labor man-hours; (b) corresponding itemized cost of Work Involved; (c) materials and equipment cost including transportation, storage, and suppliers' field services; and (d) Fee.

6.8.1.1 No proposal or claim by the Contractor on account of any asserted change not issued as a Bulletin by the PSC or Owner, shall be allowed unless initiated by written notice of such proposal or claim to the Professional and Owner within 21 days after the occurrence of the event giving rise to the proposal or claim. A full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with the initial notice shall be delivered to the Professional and Owner within 15 days of the notice, unless otherwise agreed in writing, by the Owner prior to expiration of such time.

6.8.2 For Contractor's proposals or claims for adjustments in Contract Price arising from Delays, the Contractor's estimates must be as comprehensive and detailed as may be appropriate to support the proposal or claim. Examples of related information include labor manpower levels, production data and Progress Schedule revision.

6.8.3 If the Contract Documents use lump sum or Unit Prices for the Work Involved, those prices must be used in estimating the price change. Otherwise, the Owner may direct the Contractor to proceed (a) on a negotiated lump sum; or (b) on an actual cost basis with or without a guaranteed maximum; or (c) through a unilateral Change Order on a lump sum basis or a not-to-exceed basis, based on the Professional's estimate of the anticipated Cost of the Work Involved and a fee. Items making-up the Cost of the Work Involved must be allowable to the extent (a) consistent with those prevailing in the Project locality, (b) necessary, reasonable, and clearly allocable to the Work Involved, and (c) limited to labor costs, subcontract costs, material and equipment costs, construction equipment costs and general conditions costs.

6.8.4 In estimating any additional cost by the Contractor or its Subcontractor, the rates for the craft labor man-hour used in estimating changes in Contract Price must not exceed the rates in Means Cost Data (Means) or other cost guide acceptable to the Owner. If the rates exceed the acceptable cost guides, the Contractor must provide proper justifications acceptable to the Professional and the Owner. The payroll costs may be used to quote a Bulletin. However, the payroll costs must include wages, labor burdens and a factor for field supplies and purchase costs (less market values if not consumed) of tools not owned by the workers. Labor burdens must be certified by an authorized financial representative of the Contractor and may include social security, unemployment, taxes, workers' compensation, health and retirement benefits, vacation, and holiday pay. The factor for field supplies and tools (individually valued at less than $1,000.00) must not exceed 4% of the wages without burdens, unless detailed data, which supports higher costs, is provided. Rates for owned, rented, or leased construction equipment must be in accordance with the contract price rates. Otherwise, the appropriate hourly, daily, weekly, or monthly rates listed in Means must be used. However, if the total rental or lease cost of an item to the Project exceeds the reasonable purchase price of the rented or leased item, the Owner reserves the right to pay only the purchase price of the item and take title to the item. Operating cost must not exceed the hourly operating rate in Means and for multiple shifts, rates must not exceed the shift work adjustments recommended in the cost guide.

6.8.5 The cost of any Work Involved may include necessary general conditions costs to the extent those costs increase or decrease on account of, or are directly attributable to, the performance of the furnishing and/or performance of the additional Work Involved or are required due to an extension in Contract Times or Delays. Such costs may include payroll costs of personnel, temporary facilities at the site, liability insurance and bond premiums, Subcontractors, royalty payments and fees for permits and licenses and taxes on the Work Involved.

6.8.6 A contractor or subcontractor who performs the Work may charge a fee of up to 15% of the cost of Work involved for overhead and profit. Contractor may charge a mark-up fee of up to 5% of its Subcontractor's cost excluding fees if the Work is performed by the Subcontractor. If Work is to be performed by lower tier subcontractor(s), intermediate subcontractors and the Contractor must share a fee of up to 5% of the lowest tier subcontractor's cost excluding fees. The total mark-up fees for the Work must not exceed 20% of the lowest tier subcontractor's cost excluding fees. If the adjustment to the Contract Price incorporates a

contractor reservation of rights to claim additional adjustments, the fees must be reduced by one-third. Contractor's administrative costs and home office overhead must be non-reimbursable expenses covered by the Fee for the Work.

6.9 Changes in Contract Time:

6.9.1 If a justified extension beyond the Contract Time is not reasonably anticipatable under the circumstances, the Owner may approve an extension to the Contract Time through the Bulletin authorization process at no additional cost to the Owner. Examples of events that may justify an extension in the Contract Time include acts of God; acts of the public enemy; fires; floods; and strikes.

6.9.2 If, at any time during the life of this Contract, the Contractor finds that for reasons beyond its control, it will be impossible to complete the Work on or before the Contract completion date, a written request for a change to the Contract extending the time of completion must be submitted. Such a request must set forth in precise detail the reasons believed to justify an extension and must be in such format as the State may require.

6.9.3 When submitting a quotation for a Contract change authorization for extra work or change in plans, the Contractor must include as part of the quotation, a statement requesting any extra time necessary to complete the related Work. Lack of such a statement will serve as notification that the extra time will not be required to complete the Contract work and will waive the right to a later claim. The Owner will not pay additional compensation to the Contractor for performing Contract Work during any extension period granted.

6.9.4 If the Progress Schedule and the funding allow for an early completion date, the Contractor may submit to the Owner for approval, a request to shorten the Contract Time. If approved by the Owner, the new Contract Time applies to the Project and liquidated damages, if any, will be assessed for any delays after the new completion date.

6.10 Price Reduction for Defective Cost or Pricing Data: Whenever the Contractor signs a proposal for a change in the Contract or claim settlement, the Contractor will be deemed to have certified on behalf of itself, Subcontractors and Suppliers, to its best knowledge and belief that the proposal and its contents (a) were made in good faith and are consistent with the facts and the provisions of the Contract; and (b) are current, complete, and accurate. If the Contract Price/Time is increased by any Change Order, claim or dispute settlement because the Contractor, Subcontractor or Supplier, at any tier, represented or furnished cost or pricing data of any kind that were false, contained math errors or were incomplete, the Contract Price must be correspondingly reduced by Change Order. If there is a good cause to doubt the Contractor's compliance with the Defective cost and pricing data requirements, the Owner must be entitled to make an appropriate withholding from any payment otherwise owed to the Contractor.

7. Payments:

7.1 **Schedule of Values:** The Schedule of Values must be approved by the Professional and accepted by the Owner and must divide the Work into pay items for significant Sections and areas, facilities, or structures, with subtotals for first tier Subcontractors. As required or as noted in Division 1, the accepted Schedule of Values must be supported by a more detailed breakdown allocating the pay items to the Progress Schedule Activities. It must tabulate labor costs, Subcontract costs and material and equipment costs. Labor costs must include appropriate sums for construction equipment costs, general conditions costs, administrative costs, and profit, unless separate pay items are itemized for those costs. The Schedule of Values must include two percent of the Contract Price for each of the following close-out pay items: (a) fire safety inspection, certificate of occupancy and other code approvals, as specified in the Contract Documents, (b) manufacturer warranties, finalized operating and maintenance documentation, Owner training documentation, and test and balance reports, and (c) finalized as built/Record Documents.

7.2 **Requests for Payment:** Not more than once every thirty Calendar Days, the Contractor may submit to the Professional a Request for Payment on the Owner's form signed by the Contractor certifying Work completed and enclosing all supporting documentation. A draft copy of the payment request must be submitted to the Owner Field Representative for review and comments. For projects under $50,000, the Contractor may not submit more than two requests in addition to the final payment request. Each Request for Payment must certify that all monies owed by the Contractor to Subcontractors and Suppliers for which payment previously has been sought has been paid from payments received and include a sworn statement. No Request for Payment must include amounts for a Subcontractor or Supplier if the Contractor does not intend to use the payments requested, when received, to reduce the Contractor's outstanding obligations on the Work. The Owner will pay the Contractor within thirty Calendar Days after the Owner receives and approves a certified Request for Payment from the Professional. The Contractor will provide a certification in writing that the payment request submittal is true and accurate. If payment is requested based on materials and equipment stored at the site or at another location agreed to in writing, the Request for Payment also must be accompanied by (a) consent of surety, (b) a bill of sale, invoice or other documentation warranting that the Owner has received the materials and equipment free and clear of all liens, and (c) evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect them and the Owner's interests. The Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Request for Payment, whether incorporated in the Work or not, will pass to the Owner free and clear of all liens no later than at the time of payment by the Owner to the Contractor.

7.2.1 **Electronic Funds Transfer:** The State will only disburse payments under this Contract through Electronic Funds Transfer (EFT). Contractor must register with the State at http://www.michigan.gov/SIGMAVSS to receive electronic fund transfer payments. If Contractor does not register, the State is not liable for failure to provide payment. Without prejudice to any other right or remedy it may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract.

7.3 **Review of Request for Payment; Intent of Review:** Within ten Calendar Days after receipt of a Request for Payment, the Professional must certify to the Owner the amount the Professional determines to be due or must return the Request for Payment to the Contractor indicating the reasons for withholding certification. The Professional's certification of any Request for Payment constitutes a representation to the Owner that the Work has progressed to the point indicated; that to the best of the Professional's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents; and that the Contractor is entitled to payment in the amount certified. In the case of final payment, the Professional's certification of final payment and recommendation that the Work is acceptable must be a further representation that conditions governing final payment to the Contractor have been met.

7.4 **Refusal to Make or to Recommend Payment:** The Owner may withhold from any payment an amount based on the (a) Professional's refusal to recommend payment or (b) Owner's estimate of the fair value of items included in the payment request. The Owner will give the Contractor reasonably prompt written notice supporting such action. The Professional may refuse to recommend any part of any payment, or because of subsequently discovered evidence, inspections or tests or the value of the Punch List, nullify all or any portion of any payment previously recommended, as the Professional may consider necessary to protect the Owner from loss because:

(a) the Work is Defective or completed Work has been damaged requiring correction or replacement,
(b) a defective work/non-compliance notice has not been acknowledged by the Contractor,
(c) the Contract Price has been reduced by Change Order,
(d) it has been necessary that the Owner correct Defective Work or complete Work,
(e) reasonable evidence exists that all or a part of the Work will not be completed within the corresponding Contract Time,
(f) the Contractor failed to comply with any material requirements of the Contract, including, but not limited to the failure to submit Progress Schedule Submittals or as built/Record Documents when due,
(g) stored materials for which payment has been made or is sought has been determined by the Professional or the Owner Field Representative to be damaged or missing, or
(h) the Professional reasonably believes or knows of the occurrence of an event justifying termination for cause.

7.5 **Request for Final Inspection:** The Contractor must complete the Substantial Completion Punch List within the Contract Time and date. The Contractor must assemble all required documentation before requesting final inspection in writing. The Contractor may request final inspection of the entire Work, or the part of the Work for which final payment is specified in the Contract Documents. Upon this written notice, and if deemed appropriate by the professional, the Professional will make a final completion inspection with the Owner and Contractor and notify the Contractor of all incomplete or Defective Work revealed by the Final Inspection. The Contractor must immediately correct and complete the Work.

7.6 **Close-out Documents:** The Contractor must prepare and submit the following documentation before requesting final inspection or final payment: final operating and maintenance documentation (with revisions made after Substantial Completion), warranties, inspection certificates, as built/Record Documents, release of payment claim forms, and all other required documents.

7.7 **Request for Final Payment:** The Contractor may request final payment after correcting or completing the Work to the satisfaction of the Professional and delivering close-out documentation (7.6). The Contractor's request for final payment must also enclose:

(a) evidence of completed operations insurance and an affidavit certifying that the insurance coverage will not be canceled, materially changed, or renewal refused,
(b) an affidavit certifying that the surety agrees that final payment does not relieve the surety of any of its obligations under the Performance Bond and Payment Bond,
(c) a completed DTMB-0460 Form close out checklist,
(d) a list of all pending insurance claims arising out of or resulting from the Work being handled by the Contractor and/or its insurer
(e) Contractor's 'Guarantee and Statement' (DTMB-0437) containing a statement of guaranteed indebtedness acceptable to the Owner in the full amount of the Contract Price, or a release of payment claims in the form of a release of liens, or a Bond or other security acceptable to the Owner to indemnify the Owner against any payment claim.

7.8 **Final Payment and Acceptance:** If the Professional is satisfied that the entire Work, or the part of the Work for which final payment is specified in the Contract Documents, is complete and the Contractor's other obligations under the Contract Documents has been fulfilled, the Professional will furnish to the Owner and Contractor the Professional's certification of final

payment and acceptance within thirty Calendar Days after receipt of the final payment request. If the Professional is not satisfied, the Professional will return the request to the Contractor indicating in writing the reasons for not certifying final payment. If the final payment request is returned, the Contractor must correct the deficiencies and re-request final payment. If the Owner concurs with the Professional's certification of final payment the Owner will, within thirty Calendar Days after receipt of the Professional's certification of final payment, pay the balance of the Contract Price subject to those provisions governing final payment specified in the Contract Documents. If the Owner does not concur with the Professional's determination, the Owner will return the request for final payment to the Contractor with written reasons for refusing final payment and acceptance.

7.9 **Contractor's Continuing Obligation:** The following does not constitute acceptance of the Work in the event the Work or any Work is not in accordance with the Contract Documents, and therefore does not release the Contractor from its obligation to perform and furnish the Work in accordance with the Contract Documents:

(a) a certification by the Professional of any Request for Payment or final payment.
(b) the issuance of a Substantial Completion certificate.
(c) any payment by the Owner to the Contractor.
(d) any Partial Use.
(e) any act of acceptance by the Owner or any failure to do so.
(f) any review and approval of a Shop Drawing, sample, test procedure or other Submittal.
(g) any review of a Progress Schedule.
(h) any On-Site Inspection.
(i) any inspection, test, or approval.
(j) any issuance of a notice of acceptability by the Professional; or
(k) any correction of Defective Work or any completion of Work by the Owner.

7.10 **Waiver of Claims:** The making of final payment does not constitute a waiver by the Owner of any rights as to the Contractor's continuing obligations under the Contract Documents, nor will it constitute a waiver of any claims by the Owner against the Contractor still unsettled, or arising from unsettled payment claims, Defective Work appearing after final inspection or failure by the Contractor to comply with the Contract Documents or the terms of any special warranties provided by the Contract Documents or by Law. The acceptance of final payment will constitute a waiver of all claims by the Contractor against the Owner, other than those claims previously made in writing, on a timely basis.

8. Other Work: During the Contract Time, the Owner may self-perform or Contract for other work at the site. By doing so, the Owner or its representative will coordinate the operations of the Contractor and the other work. Whenever the other work interfaces with the Contractor's Work on site, the Contractor must coordinate its activities with the interfacing work, inspect the other work and promptly report to the Professional in writing if the other work is unavailable or unsuitable. The Contractor's failure to do so will constitute an acceptance of such other work as fit and proper for integration with the Work except for latent or non-apparent defects and deficiencies in the other work. The Contractor must provide proper and safe access to the site for handling, unloading and storage of their materials and equipment and for the execution of the other work. The Contractor must do all cutting, fitting, patching, and interfacing of the Work that may be required to make any part of the Work come together properly and integrate with other work. If the Contractor becomes party to a dispute or claim due to damages caused to its Work/property or other work/their property, the Contractor must promptly attempt, without involving the Owner or the Professional or their agents, to settle with the other party by agreement or otherwise resolve the claim. If the Owner determines that the other work resulted in a delay to the Work to be performed by the Contractor and such delay justifies a Change Order, the Owner will authorize the necessary adjustment in Contract Price and/or Time.

9. Stop Work Orders and Suspension of Work: The Owner may order the Contractor in writing to defer, stop, suspend, or interrupt all or part of the Work, in the event any of the following situations:

(a) any Work is Defective,
(b) any Work, when completed, will not conform to the Contract Documents,
(c) any materials or equipment are unsuitable,
(d) any workers are insufficiently skilled,
(e) failure of the Contractor to implement appropriate measures for the SESC, or
(f) as the Owner may determine appropriate for its convenience. The Contractor is responsible for the Delays and any additional costs if at fault. Any justified increase in Contract Price/Time due to suspension of Work must be submitted within twenty-one Calendar Days of knowing the extent of Delays and before submitting the final payment.

10. Termination:

10.1 **Termination for Breach**: The Owner may elect to terminate all or any part of the Work if:

(a) the Contractor fails to complete the Work, or a specified part of the Work, within the corresponding Contract Time; fails or refuses to supply sufficient management, supervision, workers, materials, or equipment; or otherwise fails to prosecute the Work, or any specified part of the Work, with the diligence required to comply with the Contract Time(s).
(b) the Contractor persistently disregards the authority of the Professional or violates or disregards a provision of the Contract Documents or the Laws of any Political Subdivision with jurisdiction.
(c) the Contractor admits in writing, or the Owner otherwise establishes, the Contractor's inability or refusal to pay the Contractor's debts generally as they become due.
(d) in response to the Owner's demand, the Contractor fails to provide adequate, written assurance that the Contractor has the financial resources necessary to complete the Work within the Contract Time.
(e) the Contractor fails to comply with the Michigan Residency requirements (1984 PA 431, as amended, MCL 18.1241a); or is found to be in violation of Section 4 of 1980 PA 278 concerning unfair labor practices, or any nondiscrimination requirements imposed by Law.
(f) at any time, the Contractor, Subcontractor or Supplier is in violation of unfair labor practices prohibited by Section 8 of Chapter 327 of the National Labor Relations Act, 29 U.S.C. 158; or
(g) the Contractor violates or breaches any material provision of the Contract Documents, which provides contractually for cause termination or rescission of the Contract or of the Contractor's right to complete the Work.

Within seven Calendar Days after the Contractor receives a notice requiring assurance of due performance for any of the above occurring non-conformances, the Contractor must meet with the Owner and present the Contractor's plan to correct the problems. If the Owner determines that the Contractor's plan provides adequate assurance of correction, that determination does not waive the Owner's right to subsequently default the Contractor or affect any rights or remedies of the Owner against the Contractor and/or surety then existing or that may accrue in the future. The Owner, after giving the Contractor and surety seven Calendar Days' written notice of intent to default, may declare the Contractor in default and terminate the services of the Contractor for cause. Unless otherwise agreed between the Owner and Contractor, at the expiration of the Seven-Calendar Day (intent to default) period, the Contractor must immediately stop all Work and proceed in accordance with the Owner's instructions. Following the expiration of the Seven-Calendar Day (intent to default) notice, the Contractor will be sent a default letter – notice of termination for cause. The Owner will issue a Contract Change Order to revise the name of the contract party to the name of the surety company. The surety company must undertake to perform and complete the Work, in accordance with the Contract Documents, in place of the Contractor, either through the surety's agents or by executing agreements with qualified contractors (excluding the Contractor and any of the Contractor's affiliates), or both.

The Owner may issue a fifteen-Calendar Day notice of intent to default the surety company if they fail to execute in a timely manner the completion of the Contract Work. Without an adequate plan of correction, the Owner may issue a notice of termination for cause letter to the surety. If a termination of the contract with the surety occurs, the Owner reserves the right to complete the Work.

If the Owner has terminated the Contractor, any such termination will not affect any rights or remedies of the Owner against the Contractor or surety, or both, then existing or that may accrue after termination. All provisions of the Contract Documents that, by their nature, survive final acceptance of the Work must remain in full force and effect after a termination for cause of the Contractor or default of the surety, or both. The Owner may, in its sole discretion, permit the Contractor to continue to perform Work when the Contractor is in default or has been defaulted. Such decision by the Owner in no way operates as a waiver of any of the Owner's rights under the Contract Documents or Performance Bond, nor in the event of a subsequent default, entitle the Contractor or surety to continue to perform or prosecute the Work to completion.

10.2 **Termination on Non-Bonded Project**: For non-bonded projects, the Owner will follow the termination protocol in Paragraph 10.1 without involving a surety.

10.3 **Termination for Convenience of the Owner**: Upon fifteen Calendar Days' written notice to the Contractor and surety, or sooner if reasonable under the circumstances, the Owner may, without cause and without prejudice to any other right or remedy it may have, elect to terminate any part of the Work, or the Contract in whole or in part, as the Owner may deem appropriate for its convenience. Upon receipt of any such termination notice, the Contractor must immediately proceed in accordance with any specific instructions, protect and maintain the Work, and make reasonable and diligent efforts to mitigate costs associated with the termination. In such termination, the Contractor must be paid in accordance with the terms of this Contract for only services rendered before the effective date of termination. Upon termination for convenience, the Contractor must be released from any obligation to provide further services and the Owner must have full power and authority to take possession of the Work, assume any agreements with Subcontractors and Suppliers that the Owner selects, and prosecute the Work to completion by Contract or as the Owner may deem expedient.

10.4 **Termination for Lack of Funding:** If expected or actual funding is withdrawn, reduced, or limited in any way before the completion date set forth in this Contract or in any amendment, the State may, upon written notice to the Contractor, terminate this Contract in whole or in part in accordance with Paragraph 10.3.

11. Disputes: All claims, counterclaims, disputes, and other matters in question between the Owner and Contractor arising out of or relating to the Contract Documents must be submitted in writing to the Professional and otherwise processed and resolved

as provided in this Article. *Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker (Professional/PSC). Claims by either party must be initiated within 21 days after the occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognized the condition giving rise to the claim. Provided such timely notice is delivered, a full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with initial notice shall be delivered to Professional and Owner within 15 days of the notice, unless otherwise agreed in writing, by the Owner prior to expiration of such time*. The Contractor must carry on the Work with due diligence during all disputes or disagreements. Work must not be delayed or postponed pending resolution of any disputes or disagreements. The Contractor must exercise reasonable precautions, efforts, and measures to avoid situations that would cause delay.

11.1 **Notice of Claim**: Except for Owner claims for liquidated damages, no claim is valid unless it is based upon written notice delivered by the claimant to the other party and the Professional/PSC within 21 days of the event giving rise to the claim. The notice must state the nature of the dispute, the amount involved, if any, and the remedy sought. The claim submittal with all supporting data must be delivered within thirty (30) Calendar Days after the initial notice unless the Professional allows an extension by written approval. A claim by the Contractor must be submitted to the Professional and Project Director for a recommendation or decision from the Professional. A claim by the Owner must be submitted to the Contractor and the Professional for a written recommendation or decision by the Professional. The Owner reserves the right to audit any Contractor claim (or claim package) that the Contractor values at more than $50,000.00. Pending final resolution of any claim under this Article, the Contractor must proceed diligently with the Work and comply with any decision of the Owner and/or Professional. For all Contractor claims seeking an increase in Contract Price or Contract Time, the Contractor must submit an affidavit, certifying that the amount claimed accurately reflects any Delay and all costs that the Contractor is entitled from the occurrence of the claimed event and that supporting cost and pricing data are current, accurate, complete and represent the Contractor's best knowledge and belief. The affidavit must be signed in the same manner as required in Item 6 of Section 00100.

11.2 **Recommendations or Decisions from the Professional:** For claims under $100,000.00, if requested in writing by the Contractor, the Professional will render a recommendation or decision within thirty Calendar Days after the request and the Owner will issue, if necessary, a determination within thirty Calendar Days after the Professional's recommendation or decision. For claims exceeding $100,000.00, the Professional will issue its recommendation or decision and the Owner, if necessary, will issue its determination, within sixty Calendar Day.

If the Professional denies a Contractor claim or agrees with an Owner claim, that decision must be final and binding on the Contractor, without any determination by the Owner, unless the Contractor files a request for a presentation with the Director-DCD within thirty Calendar Days. To the extent that any recommendation from the Professional is partly or wholly adverse to a claim from the Owner, that determination must be final and binding on both the Owner and Contractor unless either party files a request for a presentation with the Director-DCD within thirty Calendar Days. If the Professional recommends payment of any Contractor claim which increases the Contract Price, that recommendation is subject to the Owner's written approval. In the event any such determination from the Owner is partly or wholly adverse to the preceding recommendation from the Professional, that determination must be final and binding on the Contractor unless the Contractor files suit in the Michigan Court of Claims within thirty Calendar Days after receipt of such determination. The claim is waived if not made in accordance with these requirements.

If either the Contractor or Owner is not satisfied with any decision of the Professional on a claim, that party must, within thirty Calendar Days of receiving that decision, file a written appeal with complete supporting documentation with the Director-DCD. The Director-DCD has discretion concerning the allowability of evidence submitted and is not bound to any rules of evidence. If the right to a presentation is waived or if a presentation is conducted and the dispute remains unresolved, the Director-DCD, at the Director-DCD's sole option, must specify in which forum the dispute must be conducted by issuing a written determination to the Contractor that the dispute if the Contractor so elects, be submitted in writing to the Michigan Court of Claims. The Director-DCD's determination on the dispute is final and binding on the Contractor unless the Contractor files a lawful action in the Michigan Court of Claims within thirty Calendar Days after receiving the Director-DCD's determination. After settlement or final adjudication of any claim, if payment by the Contractor is not made to the Owner, the Owner may offset the appropriate amounts against (a) payments due to the Contractor under any other Contract between the Owner and the Contractor, or (b) any amounts for which the Owner may be obligated to the Contractor in any capacity. The Director-DCD may designate someone to fulfill the Director-DCD's duties under these terms and conditions.

END OF SECTION 00700

SECTION 00750 SPECIAL WORKING CONDITIONS

1. The Work is for the Department of Military and Veterans Affairs, and their special working conditions are included in Appendix II. Contractor must comply with all security regulations. Access to and egress from the buildings and State Agency grounds must be via routes specifically designated by the State Agency. Whenever the Contractor has caused an operating security or fire system to go out of service or left unsecured openings in existing facilities or security fences, the Contractor must furnish a security guard or fire

watch acceptable to the Owner to maintain security of the facility outside of normal working hours and will be held responsible for any losses from the facility.

2. The Contractor must maintain, at all times, dust control measures to the satisfaction of the Owner.

3. **The site work days shall be limited to: June 29 through July 21, 2026. Site work hours are limited to 7am to 7pm on business days, however, Contractor may obtain pre-approval for any early and late work. Contractor may be allowed to work on weekends, however, shall be approved by Owner and Professional one week prior to the requested weekend work dates and times. The pre-construction meeting is anticipated to be conducted on June 11, 2026, and access will be provided to the Contractor during the day of the pre-construction meeting to collect necessary waste characterization samples to obtain disposal facility approvals.**

END OF SECTION 00750

SECTION 00800 SUPPLEMENTARY CONDITIONS

1. The following conditions must supplement the general conditions:

    1. Bonds and Insurance: Add the following at the end of Paragraphs 3.2(a) and 3.2(b) of Section 00700 General Conditions:

        The Contractor shall also list DLZ Michigan, Inc. as ADDITIONAL INSUREDS.

    2. Changes: Replace Paragraph 6.6 of Section 00700 General Conditions with the following:

        Unit Price Work: Quantities as listed have been carefully estimated but are not guaranteed. The Owner reserves the right to increase or decrease the quantities of the Work to be performed at the Unit Price by amounts up to 50 percent of the listed estimated quantities. For Unit Price Work, the Contractor must promptly inform the Professional in writing if actual quantities differ from the estimated quantities for any item. For quantities over 150% or below 50% of the estimated quantity, the Owner may negotiate a Unit Price with the Contractor, or direct a unilateral change, or bid that Work under separate contract. Any adjusted Unit Price agreed upon by the Owner will only apply to the actual quantities above 150% or below 50% of the estimated quantity. No adjustment due to quantity variations must be allowed (a) unless the Contractor met the notice requirements, or (b) if any Unit Price increase results in whole or in part from any act or omission within the control of the Contractor (errors in the Contractor's Bid, unbalanced Unit Prices, etc.). If a dispute arises between the Owner and the Contractor on the adjusted Unit Price, the Contractor must carry on the Work with due diligence during the disputes/disagreements.

END OF SECTION 00800

SECTION 00900 ADDENDA

1. Each Bid submittal must include acknowledgement of receipt and review of all Addenda issued during the Bidding period.

END OF SECTION 00900

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 BACKGROUND

The Michigan Army National Guard (MIARNG) Fort Custer Training Center (FCTC) is located near Augusta, Michigan, in Kalamazoo and Calhoun Counties in southwestern Michigan (Figure 1). The facility occupies approximately 7,570 acres and serves as a training area for both active and reserve military forces. The FCTC is a federally owned property, managed by the State of Michigan. The Small Arms Firing Ranges are comprised of 14 different ranges. Twelve ranges (R1 through R12) are used for live fire weapons training ranging from small caliber pistols and rifles to machine guns and grenade launchers. Two (2) additional ranges, the Light Anti-Tank Weapon (LAW) Range (Range 13) and the M-31 SABOT Artillery/Light Demolition Range (Range 14) are also used periodically.

A Site Location Map and Site Map are provided as Figures 1 and 2, respectively. Small arms ranges at FCTC are depicted in Figures 3 and 4. The backstop berms at the ranges 2, 3, 4, 5 and 6 (identified as R2, R3, R4, R5 & R6 in the figures) were tested for lead due to high levels of lead detected in groundwater. Table 1 provides sieving and analytical results summary of samples collected at all backstop berms. Sample location map and laboratory results of the sample collected at Range 5 are provided in Appendix VI.

1.02 GENERAL LAND USE

The FCTC is within a fenced in secured area with a guarded entrance. The surrounding area consists of mostly industrial and commercial properties.

1.03 SCOPE OF WORK

The goal of Michigan Department of Military and Veterans Affairs (MDMVA) is to remove the lead impacted soils from the face of the backstop berm at Range 5 and dispose of at a licensed off-site hazardous waste disposal facility and reconstruct the berm in accordance with the Unified Facilities Criteria Small Arms Ranges UFC 4-179-02 (Appendix VII) and the contract documents. The overall Scope of Work, to achieve this goal, includes, but is not limited to:

1. Site Services, Mobilization, and Demobilization.
2. Waste characterization of the contaminated berm soils.
3. Removal, transportation and disposal of contaminated berm soils.
4. Treatment and reconstruction the berm.
5. Site restoration.

1.04 PERFORMANCE OF WORK - GENERAL

A. The Work shall be performed by properly trained and equipped **CONTRACTOR** personnel. All intrusive Work involving potential contact with contaminated materials shall be conducted by **CONTRACTOR** employees that have completed initial and annual OSHA

training and medical surveillance, in accordance with 29 CFR 1910.120(e) and (f). Documentation verifying employees' compliance with this requirement shall be submitted to the **PROFESSIONAL** prior to the commencement of Work, as outlined throughout the Contract Documents and specifications.

C. The site work days shall be limited to: June 29 through July 21, 2026. Site work hours are limited to 7am to 7pm on business days, however, Contractor may obtain pre-approval for any early and late work. Contractor may be allowed to work on weekends, however, shall be approved by Owner and Professional one week prior to the requested weekend work dates and times. The pre-construction meeting is anticipated to be conducted on June 11, 2026, and access will be provided to the Contractor during the day of the pre-construction meeting to collect necessary waste characterization samples to obtain disposal facility approvals.

1.05 DEFINITIONS

Please refer to Section 01090

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01020

ALLOWANCES

PART 1 GENERAL

1.01 ALLOWANCES

A. Provisional/Contingency Allowances

1. Bidders must include in their Base Proposal Sum a contingency allowance as identified in the bid schedule. The base bid shall include bonds and insurance on the value of the allowance.
2. Monies will be used in the contingency allowance only if directed by the **OWNER** and **PROFESSIONAL**.
3. Payments under a Provisionary Allowance will include not only the purchase/furnished cost of the materials and equipment involved, but also all related labor costs, subcontract costs, construction equipment costs, general conditions costs and fees, provided they are calculated in accordance with the requirements of the contract documents.
4. Unused allowances will be deducted from the contract amount through contract change order.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

All units of measurement shall be United States Customary System units' convention as applied to the specific items of Work as interpreted by the **PROFESSIONAL**.

A. Schedule of Values

The Schedule of Values is an itemized list that establishes the value or cost of each line item. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional Work or credits, which may arise during the construction. Quantities and unit prices may be included in the Schedule of Values, when approved by or required by **PROFESSIONAL**.

1. Preparation

a. The Schedule of Values shall include:
   i. Project name and location
   ii. Project number
   iii. Name, address, and phone number of **CONTRACTOR**
   iv. Date of submission

b. Cost itemizations shall be in sufficient detail to indicate separate values for each part of the Work. The **CONTRACTOR** is required to submit a detailed breakdown of each line item for this project. The breakdown, at minimum, will include labor, tools, material, equipment, sampling costs, insurance, bonds, and subcontractor costs.

c. When requested by the **PROFESSIONAL**, support values with data that will substantiate their correctness.

d. The sum of the individual values shown on the Schedule of Values must equal the total Contract price.

e. The Schedule of Values may separately itemize the costs of purchase and delivery and the costs of installation, if the **CONTRACTOR** intends on requesting payment for these activities prior to installation.

B. Unit Price Items

Payment items for the Work of this Contract on which the progress payment will be based are listed in the Bid Schedule and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, and equipment; and performing any associated **CONTRACTOR** quality control, environmental protection, safety requirements, sampling, tests, and reports; and for performing all Work required for each of the unit price items. Payment is contingent upon approval of all

applicable submittals. Payment shall be paid for the actual amount of Work accepted. The amount will be in accordance with prices submitted on the Bid Schedule.

C. Lump Sum Items

Payment items for the Work of this Contract for which Contract lump sum payments will be made are listed in the Bid Schedule and described below. Contract progress payments for lump sum items will be paid for based on the approved Schedule of Values (See Section 01291). All cost for items of Work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the Work involved as determined by the **PROFESSIONAL**. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, and equipment; performing any associated **CONTRACTOR** quality control, environmental protection, safety requirements, sampling, tests and reports; and for performing all Work required for which separated payment is not otherwise provided. Payment is contingent upon approval, by the **PROFESSIONAL**, of all applicable submittals. Payment shall be paid on the Work completed and accepted. One hundred percent of the Contract price for the Work completed and accepted may be paid, subject to the limitations of the Contract Documents. The **OWNER** reserves the right to pay the **CONTRACTOR** a portion of a lump sum line item, if all of the Work originally tasked is not performed as stated herein, as determined by the **PROFESSIONAL**.

D. Provisionary Allowance Items

Payment for work under a Provisionary Allowance is subject to issuance of Change Authorization. A Change Authorization is a written order approved by the Owner and issued by the Professional, which directs changes in the Work that requires no adjustment to Contract Price or Contract Time. Monies in the allowance will be used only if directed in writing by the Project Director and Professional. Unused allowance monies will be deducted from the contract amount through contract change order. Also refer to Section 00700, 6.7.

E. Cash Allowance Items

Payments under a Cash Allowance must be on actual cost and exclude cost for supervision, handling, unloading, storage, installation, testing, fee, premiums for bond and insurance, markups, etc. Monies in the cash allowance will be used only if directed in writing by the Project Director and Professional. No markup allowed for Cash Allowance pay item. Also refer to Section 00700, 6.7.

F. The **CONTRACTOR** shall be required to post performance bonds, for both labor and material, for the total bid amount.

1.02 PAYMENT

A. Refer to Division 0 Section 00700. Division 0 supersedes in case of a discrepancy.

B. Payments to the **CONTRACTOR** will be made for the actual quantities of the Contract items

performed and accepted, in accordance with the Contract Documents. Upon completion of the Work, if the actual quantities show a decrease or increase from the quantities included in the Contract, the Contract unit prices will prevail, except as provided hereinafter.

C. The **CONTRACTOR** shall accept compensation, as provided herein, as full payment to furnish all materials, labor, tools, equipment, and incidentals necessary to complete the Work; for performing all Work stated by the Contract; for all loss or damage arising from the nature of the Work, from the action of the elements, or from any unforeseen difficulties that may be encountered during the execution of the Work and until its final acceptance by the **PROFESSIONAL** and **OWNER**; for all risks of every description connected with the execution of the Work, except as provided herein; and for all expenses incurred in consequence of the suspension of the Work, as herein authorized.

D. No extra payment or contract extensions will be made to the **CONTRACTOR** for any expense or delays caused by the revision of inadequate submittals, lack of progress, weather, defective workmanship, or rescheduling.

E. Additional costs caused by ill-timed or defective Work, or Work not conforming to the Contract Documents, shall be incurred solely by the **CONTRACTOR**.

F. Work completed shall be invoiced on a monthly basis, from the first of the month to the end of the month. Only Work completed to date and within that month period shall be invoiced. Completion of Work will be verified by the **PROFESSIONAL** and/or **OWNER** prior to the approval of the invoice.

G. Final Application for Payment shall be submitted pursuant to the Contract Documents.

H. **The estimated quantities for unit price pay items, as listed in the Bid Schedule, are approximate only and are included solely for the purpose of comparison of Bids**. The **OWNER** and **PROFESSIONAL** do not express or by implication agree that the actual quantities of material encountered or required will correspond with the Bid Schedule. The **OWNER** reserves the right to increase, decrease, or eliminate any quantity deemed necessary. When alterations in quantities are within plus or minus 50 percent of the original estimated quantity of Work listed on the Bid Schedule, the **CONTRACTOR** will not be entitled to any adjustments in the unit bid price as a results of any changes in the estimated quantities, and agrees to accept the aforementioned unit bid prices as complete and total compensation for any additions caused by changes or alteration in the Work and ordered by the **OWNER** and **PROFESSIONAL**. Also refer to Section 00700, 6.6.

I. When alterations in quantities are greater than plus or minus 50 percent of the original estimated quantity of Work, listed on the Bid Schedule, the **CONTRACTOR** will be required to document, to the satisfaction of the **PROFESSIONAL**, all labor, materials, and equipment costs related to the increase/decreased quantity. Also refer to Section 00700, 6.6.

1.03 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. Payment for increased or decreased quantities shall be as specified in the Contract

Documents.

B. Increased or decreased work involving Change Orders will be paid for, as stipulated in such Change Orders.

1.04 INCIDENTAL WORK

A. Work items for which separate payments are not measured, but are included as part of the Contract include, but are not limited to, the following:

1. Field supervision
2. Jobsite administration
3. All required signs
4. Traffic control
5. Dust monitoring and control
6. Project record documents
7. All temporary fencing and barriers
8. Restoration of disturbed areas not designated or described in these Contract Documents
9. Health and safety requirements
10. Cooperation with other subcontractors
11. Environmental protection
12. Locating, and protecting site utilities, as applicable
13. Site cleaning including street cleaning
14. All activities required to conform to MDOT standards and regulations and permit requirements, that are not specified herein
15. QA/QC
16. Invoicing/Billing
17. Storage and security of materials and equipment

1.05 SPECIFIC BASE BID PAY ITEMS:

A. Contract Item No. 1 – Mobilization (Lump Sum)

Payment for Mobilization shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, tools, materials, storage, and equipment for the movement and establishment of **CONTRACTOR's** facilities, equipment, personnel, security, supplies, and incidentals to perform the work including construction (prior to starting work) of access roads, ramps, and exits.

B. Contract Item No. 2 – Site Services (Lump Sum)

Payment for Site Services shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, transportation, equipment, tools, incidentals, materials, and subcontracting services for site security; protection of utilities and structures to remain in place; establishment, protection, acquisition and maintenance of temporary and/or permanent utilities; temporary heating; clearing and grubbing as needed; surface water

controls; installation, maintenance, and removal of a temporary storm water management system; temporary sanitary facilities; installation, maintenance, and removal of soil erosion and sedimentation control measures as approved by the **PROFESSIONAL** and as required by applicable permit(s); proper decontamination of all equipment and materials; disposal of decontamination water; bonds; insurance; taxes; acquisition of all necessary permits, notifications, certifications, and authorizations to conduct work; close-out; barricades and traffic control; project coordination; project meetings; material storage; road maintenance; pre-and post- construction submittals/plans, all required sampling and analytical testing associated with site services and all other **CONTRACTOR** work tasks not stated herein but that are included in these specifications or necessary to perform the work, which are not part of other bid items. This item also includes covering the stockpiled berm soils using 10-mil plastic sheeting if left overnight.

C. Contract Item No. 3 – Waste Characterization (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item includes all labor, equipment, tools, materials, and services necessary for waste characterization, representative sample collection from the backstop berm at Range 5, sample analyses, and coordination to obtain disposal facility acceptance for the disposal of contaminated berm soils at a RCRA Subtitle C Hazardous Waste Landfill. This item includes coordination with the disposal facilities to complete waste profiles and obtain approvals for disposal. This item includes removal and stockpiling of the berm soils, if necessary, for the collection of a composite sample(s).

D. Contract Item No. 4 – Removal, Transportation and Disposal of Berm Soils as Hazardous Waste (Ton)

Payment for this item shall be paid for at the Contract Unit Price per ton. This item includes all labor, equipment, tools, and materials necessary to remove, transport and properly dispose of hazardous backstop berm soils with contaminant levels exceeding 10x universal treatment standards. Contractor shall handle, transport, treat, and dispose the hazardous soils in compliance with RCRA and all applicable regulations and in accordance with these Contract Documents. This item also includes necessary treatment of the soils at a RCRA TSD to comply with the universal treatment standards. This item also includes providing of weigh tickets (approved scale) to verify the quantity of contaminated soil removed, transported, and disposed.

E. Contract Item No. 5 – Berm Treatment (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, transportation, equipment, tools, incidentals, materials, storage, and subcontracting services to spread lime and/or other approved stabilization material spread evenly over the entire disturbed surface area of the berm face immediately prior to the placement of the sand for berm reconstruction. This item includes necessary dust control provisions including worker safety during the handling and spreading of the material. The material will be paid using the Owner's Allowance pay item.

F. Contract Item No. 6 – Fill Sand (Ton)

Payment for this item shall be paid for at the Contract Unit Price per ton. This item includes all labor, equipment, tools, and materials necessary to procure MDOT Class II fill sand, modified to 100% pass through #4 sieve, to reconstruct the berm. The Contractor shall provide weigh tickets from a certified scale to verify the quantity of fill sand utilized for the berm reconstruction. This item also includes all sampling, analysis, and testing, to verify the fill sand is not contaminated, and backfill compaction for a stable berm as required by the Contract Documents. The fill sand testing shall include Michigan 10 metals, DRO, GRO, ORO, and PFAS (40 compound list).

G. Contract Item No. 7 – Berm Reconstruction (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum price. This item includes all labor, tools, equipment, and materials necessary for placing, grading, leveling, and compaction of fill sand on the berm face after completion of the removal of contaminated soils, and the collection of necessary verification soil samples. Work includes placing and compacting the fill sand to maintain a stable berm surface. Work also includes procuring, placing and spreading a minimum 4-inches thick top soil over the entire disturbed area of the berm after the completion of fill sand placement and compaction. The finished berm face slope shall match the preexisting slope. This item also includes all sampling, analysis, and testing, to verify the top soil is not contaminated. The top soil testing shall include Michigan 10 metals, DRO, GRO, ORO, and PFAS (40 compound list).

H. Contract Item No. 8 – Site Restoration (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, transportation, equipment, tools, incidentals, materials, storage, and subcontracting services for site and surface restoration, grading of all disturbed areas with top soil and seeded, surface repairs (e.g., sidewalks, pavement, shoulders, etc.), repairs/replacement of damaged features that are to remain, and general cleanup of the site. All Site Restoration shall be performed in conformance with MDOT standards, local standards, and these Specifications, whichever is most strict.

I. Contract Item No. 9 – Demobilization (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, transportation, equipment, tools, incidentals, materials, storage, and subcontracting services for the removal of **CONTRACTOR's** facilities, equipment, personnel, security, supplies, and incidentals at the conclusion of the work including the removal (at the conclusion of work) of access roads, ramps, and exits; removal of temporary storm water management system, sanitary facilities, and temporary soil erosion and sedimentation control measures upon approval of the permitting agency and as approved by the **PROFESSIONAL/OWNER**.

J. Contract Item No. 10 – Owner's Allowance (Provisionary Allowance)

A provisionary allowance shall be included, in the event that unforeseen conditions arise as identified by the **PROFESSIONAL**. This allowance may only be used upon approval by the **OWNER** and issuance of change authorization by the **PROFESSIONAL**. Payment shall be in accordance with the conditions of the Contract Documents. The **CONTRACTOR** shall provide appropriate backup documentation with payment request. Unused allowances will be deducted from the contract amount through contract change order.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.01 PROJECT COORDINATION

A. **CONTRACTOR** shall follow all Fort Custer policies and procedures.

B. Prior to beginning the Work, the **CONTRACTOR** shall meet with the **PROFESSIONAL** and **OWNER** in order to arrange the schedule for the project. Once the project is started, it shall be carried to completion without delay.

C. Phasing of Work shall be clearly established and verified through the **PROFESSIONAL** prior to commencing Work in any area. No site work shall begin until authorized by the **OWNER** or **PROFESSIONAL**.

D. The **CONTRACTOR** is responsible for contacting MISS DIG, and all other applicable utility companies, a minimum of three working days prior to start of any underground work in compliance with Public Act 174 of 2013 and MIOSHA Rule 408.40931. MISS DIG 811 or 1-800-482-7171.

E. **CONTRACTOR** is responsible for notifying Fort Custer Public Works one week prior to the start of site work to mark private utilities.

F. All communications, submittals, questions, etc. shall be directed to the **PROFESSIONAL** throughout the duration of the project.

G. Once the project started, any changes in work schedule shall be communicated to the **PROFESSIONAL** within 48 hours.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 REGULATORY REQUIREMENTS

The Contractor shall comply with all federal, state, and local rules, ordinances, and regulations; Code of Federal Regulations, MDOT, EGLE, Public Act 451; Building Codes, National Electric Codes, National Fire Protection Association; ASTM; County and local codes and ordinances, and all other applicable ordinances and regulations relating to employment, the preservation of public health and safety, and so forth. All necessary permits or certifications of inspection shall be paid for and obtained by the Contractor.

A. **Laws:** The Contractor and its Subcontractors/Suppliers must comply with all Federal, State and local Laws applicable to the Work and site.

B. Codes: All Works must be provided in accordance with the State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seg., International Building and Residential Codes and all applicable Michigan construction codes and fire safety including but not limited to: Michigan Building Code, Michigan Residential Code, Michigan Uniform Energy Code, Michigan Electrical Code, Michigan Rehabilitation Code for Existing Buildings, Michigan Mechanical Code, Michigan Elevator Code and Michigan Plumbing Code. If the Contractor observes that any Contract Document conflicts with any Laws or the State Construction Code or any permits in any respect, the Contractor must promptly notify the Professional in writing. If the Contractor provides any Work knowing or having to reason to know of such conflict, the Contractor must be responsible for that performance.

C. Permits: All required permits and authorizations must be secured and their fees including inspection costs must be paid by the Contractor to perform the Work. The time incurred by the Contractor in obtaining permits must constitute time required to complete the Work and does not justify any increases to the Contract Time or Price. The Contractor must pay all charges of Public Utilities for connections to the Work, unless otherwise provided by Cash Allowances specific to those connections. The Contractor shall comply with all permit and/or authorization requirements.

D. **Taxes:** The Contractor must pay all Michigan sales and use taxes and any other similar taxes covering the Work that are currently imposed by legislative enactment and as administered by the Michigan Department of Treasury, Revenue Division. If the Contractor is not required to pay or bear the burden or obtains a refund of any taxes deemed to have been included in the Bid and Contract Price, the Contract Price must be reduced by a like amount and that amount, whether as a refund or otherwise, must ensure solely to the benefit of the State of Michigan.

E. **Safety and Protection:** The Contractor and its Subcontractors/Suppliers must comply with all applicable Federal, State and local Laws governing the safety and protection of persons or property, including, but not limited to the Michigan Occupational Safety and Health Act (MIOSHA), 1974 PA 154, as amended, MCL 408.1001 et seg., and all rules promulgated under the Act. The Contractor is responsible for all damages, injury or loss to the Work, materials, equipment, fines, penalties as a result of any violation of such Laws, except when it's due to the fault of the Drawings or Specifications or to the Act, error or omission of the Owner or Professional. The Contractor is solely responsible for initiating, maintaining and supervising all safety precautions and programs and such responsibility must continue until such time as the Professional is satisfied that the Work, or Work inspected, is completed and ready for final payment. In doing the Work and/or in the event of using explosives, the Contractor must take all necessary precautions for the safety of, and must erect and maintain all necessary safeguards and provide the necessary protection to prevent damage, injury or loss to: (a) all employees on the Work and other persons who may be affected by the Work, (b) all the Work and materials and equipment to be incorporated into the Work, whether stored on or off the site, and (c) other property at or adjacent to the site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Utilities not designated for removal, relocation or replacement. In the event of severe weather, the Contractor must inspect the Work and the site and take all reasonably necessary actions and precautions to protect the Work and ensure that public access and safety are maintained.

F. **Fire Hazard Conditions:** The fire hazard classification of finish materials where used in the specification must be in accordance with the current Michigan Building Code. Classification must be determined by tunnel test in accordance with National Fire Protection Association (NFPA-255), American Society for Testing Materials (ASTM E-84) or Underwriters' Laboratories, Inc. (UL-723).

G. **Michigan Right-To-Know Law:** The Contractor and its Subcontractors/Suppliers must comply with MIOSHA, Michigan Right-to-Know Law (Public Act 80 of 1986) and the rules promulgated under it. The Act places certain requirements on employers to develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Safety Data Sheets (SDS), and to provide training for employees who work with these chemicals and develop a written hazard communications program. The Act also provides for specific employee rights, including the right to be notified of the location of SDS and to be notified at the site of new or revised SDS within five Business Days after receipt and to request SDS copies from their employers. The Contractor, employer or Subcontractor must post and update these notices at the site.

H. **Environmental Requirements:** The Contractor and its Subcontractors/Suppliers must comply with all applicable Federal, State and local environmental Laws, standards, orders or requirements including but not limited to the National Environmental Policy Act of 1969, as amended, Michigan Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended, the Clean Air Act, as amended, the Clean Water Act, as amended, the Safe Drinking Water Act, as amended, Pollution Prevention Act, as amended, Resource Conservation and Recovery Act, as amended, National Historic Preservation Act, as amended and Energy Policy and Conservation Act and Energy Standards for Buildings Except Low-Rise Residential Buildings, ANSI/ASHRAE/IESNA Standard 90.1-1999.

I. **Nondiscrimination:** For all State Contracts for goods or services in amount of $5,000 or more, or for Contracts entered into with parties employing three or more employees; in connection with the performance of Work under this Contract, the Contractor and its Subcontractors and Suppliers must comply with the following requirements:

- Not to discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex, height, weight or marital status and take affirmative action to ensure that applicants are employed and the employees are not subject to such discrimination. Such action must include, but is not be limited to, the following: employment, upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training.
- To state in all solicitations or advertisements for employees that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight or marital status.
- To send, or have its collective bargaining representative send, each labor union or representative of workers with which there is a collective bargaining agreement or other contract or understanding, a notice advising the labor unions or workers' representative of the commitments under this provision.
- To comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended , MCL 37.2201 et seq.; the Michigan Persons With Disability Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et Seq.; and all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission (MCRC) which may be in effect on or before the date of Bid opening.
- The Contractor must furnish and file compliance reports within the times, and using the forms prescribed by the MCRC. Compliance report forms may also elicit information as to the practices, policies, programs, and employment statistics of the Contractor and Subcontractors. The Contractor must permit access to Records by the MCRC and its agent for purposes of ascertaining compliance with the Contract and with rules, regulations, and orders of the MCRC.
- If, after a hearing held under its rules, the MCRC finds that the Contractor has not complied with the nondiscrimination requirements of the Contract Documents, MCRC may, as part of its order, certify its findings to the Administrative Board of the State of Michigan, which may order the cancellation of the Contract and/or declare the Contractor ineligible for future contracts with the State until the Contractor complies with the MCRC's order.

J. **Michigan Residency for Employees:** Fifty percent of the persons employed on the Work by the Contractor must have been residents of the State of Michigan for not less than one year before beginning employment on the Work. This residency requirement may be reduced or waived to the extent that Michigan residents are not available or to the extent necessary to comply with the federal funds used for the Project. This requirement does not apply to employers who are signatories to collective bargaining agreements that allow for the portability of employees on an interstate basis.

1.02 REFERENCES

The following references are part of this specification to the extent referenced.

A. Federal Laws

1. PL 94-850/98-616 Resource Conservation and Recovery Act (RCRA) of 1976, as amended 1984
2. PL 91-596 Occupational Safety and Health Act (OSHA) of 1970

B. Code of Federal Regulations (CFR)

1. 29 CFR 1926 Safety and Health Regulations for Construction
2. 49 CFR 173 General Shipment Requirements
3. 49 CFR 174-77 Transporter Requirements
4. 49 CFR 178-79 Container Specifications

C. State of Michigan Laws

1. P.A. 154 Michigan Occupational Safety and Health Act (MIOSHA)

D. Local Laws

1. Village, Township, City and County Ordinances

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01090

REFERENCES

PART 1 GENERAL

1.03 DEFINITIONS

References will be made in an abbreviated alpha numeric form to specific standard specifications, reference publications and building codes of federal or state agencies, manufacturers, associations, or trade organizations. Such references will be identified by the alphabetic abbreviation which identifies the government agency, the association or organization followed by the rule, section or detail number that are to form a part of these specifications, the same as if fully set forth herein, and must be of latest issued date in effect three months before the Bid opening date shown on the Proposal and Contract. The abbreviations used are referred to as follows:

Abbreviation	Agency, Association, Organization, or Phrase
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction, Inc.
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BGS	Below Ground Surface
BOCA	Building Officials and Code
CDA	Copper Development Assn., Inc.
CFR	Code of Federal Regulations
CLFMI	Chain Link Fence Manufacturer's Institute
CIPP	Cured-In-Place-Pipe
CISPI	Cast Iron Soil Pipe Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	United States Environmental Protection Agency
F/M	Factory Mutual Research Corporation
FS	Federal Specifications
HEW	United States Department of Health Education and Welfare
HMA	Hot Mix Asphalt
ISO	International Organization for Standardization
MACP	Manhole Assessment Certification Program

MDOT	Michigan Department of Transportation
MIOSHA	Michigan Occupational Safety and Health Administration
NASSCO	National Association of Sewer Service Companies
NEC	National Electric Code
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation Testing Laboratory, Inc
NSWMA	National Solid Waste Management Association
OSHA	Occupational Safety and Health Administration
PACP	Pipeline Assessment and Certification Program
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
RCRA	Resource Conservation and Recovery Act
SMACNA	Sheet Metal & Air Conditioning Contractors
UL	Underwriters Laboratories, Inc.
USBM	United States Bureau of Mines
USDC	United States Department of Commerce

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01100

PROJECT PROCEDURES

PART 1 GENERAL

1.01 SIGNAGE AND SAFETY

The **CONTRACTOR** must post appropriate construction signs to advise the occupants and visitors of occupied facilities of the limits of construction work areas, hardhat areas, excavations, construction parking and staging areas, etc. Advertising signage by contractors, subcontractors, or suppliers is not allowed. The **CONTRACTOR** must maintain safe and adequate pedestrian and vehicular access to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, hospitals, fire, and police stations and like establishments. The **CONTRACTOR** must obtain written approval from the **OWNER** ten Calendar Days before connecting to existing facilities or interrupting the services on site.

1.02 REQUIRED PROJECT SIGN

For projects costing in excess of $500,000, the **CONTRACTOR** must provide and install a project sign conforming to the requirements shown in Appendix IV. The **OWNER** will designate the wording for the sign.

1.03 BARRIER AND ENCLOSURES

A. The **CONTRACTOR** must furnish, install, and maintain as long as necessary and remove when no longer required adequate barriers, warning signs or lights at all dangerous points throughout the Work for protection of property, workers, and the public. The **CONTRACTOR** must hold the State of Michigan harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the Work under the Contract.

B. Temporary Fence: The **CONTRACTOR** must entirely enclose the Contract area by means of woven wire or snow fence having minimum height of four feet. Gates must be provided at all points of access. Gates must be closed and secured in place at all times when Work under the Contract is not in progress. The fence must be removed, and grounds restored to original condition upon completion of the Work.

C. Street Barricades: The **CONTRACTOR** must erect and maintain all street barricades, signal lights and lane change markers during the periods that a traffic lane is closed for their operations. There must be full compliance with rules and ordinances respecting such street barricading and devices must be removed when hazard is no longer present.

1.04 CONSTRUCTION AIDS

A. The **CONTRACTOR** must furnish, install, and maintain as long as necessary and remove when no longer required, safe and adequate scaffolding, ladders, staging, platforms, chutes, railings, hoisting equipment, etc., as required for proper execution of the Work. All

construction aids must conform to Federal, State, and local codes or Laws for protection of workers and the public.

B. Pumping and Drainage: The **CONTRACTOR** must construct and maintain any necessary surface drainage systems on the Work site so as to prevent water entering existing structures or to flow onto public or private property adjacent to the Agency's land, except for existing drainage courses or into existing drainage systems. The **CONTRACTOR** must prevent erosion of soils and blockage of any existing drainage system.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 PRE-CONSTRUCTION CONFERENCES

The **PROFESSIONAL** will schedule a pre-construction conference to be attended by the **PROFESSIONAL**, **OWNER**, and the **CONTRACTOR**. A project procedure as outlined in Form DTMB-0460, will be established for the Work during the pre-construction meeting. When no organizational meeting is called, the **CONTRACTOR**, before beginning any Work, must meet with the **PROFESSIONAL** and **OWNER** and arrange a Work schedule for the Project. Once the Project has been started, the **CONTRACTOR** must carry it to completion without delay.

1.02 PROJECT KICK-OFF MEETING

A project kick-off meeting will be conducted immediately prior to the start of site work if required by the **PROFESSIONAL or OWNER** and shall be attended by the **CONTRACTOR** represented by persons with full authority to act for the **CONTRACTOR** in regard to all portions of the Work.

1.03 PROGRESS MEETINGS

The **PROFESSIONAL** will schedule weekly (and whenever needed) progress meetings to be held on the job site to supply information necessary to prevent job interruptions, to observe the Work or to inspect completed Work. The **CONTRACTOR** must be represented at each progress meeting by persons with full authority to act for the **CONTRACTOR** in regard to all portions of the Work.

1.04 SUBSTANTIAL COMPLETION

The **CONTRACTOR** must notify the **PROFESSIONAL**, and the **OWNER** when the Work will be substantially complete. The Professional will schedule a substantial completion meeting to be held at the job site to inspect the Work. The **PROFESSIONAL**, upon determining that the Work, or a portion of the Work inspected, is substantially complete, will prepare a Punch List and will attach it to the respective Certificate of Substantial Completion. The **CONTRACTOR** must be represented on the job site at the time this inspection is made and thereafter must complete all Work by the date set for final acceptance by the **OWNER**.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 PURPOSE

To verify that products, systems, forms, and services proposed by the **CONTRACTOR** for use on this Project conform with the design intent. **CONTRACTOR** shall submit to the **PROFESSIONAL** project data, shop drawings, samples, certifications, schedules, manuals, and other submittals, as required in these specifications.

1.02 RESPONSIBILITY AND AUTHORITY

Neither the **OWNER**'s authority to review any of the Submittals by the **CONTRACTOR**, nor the **OWNER**'s decision to raise or not to raise any objections about the Submittals, creates or imposes any duty or responsibility on the **OWNER** to exercise any such authority or decision for the benefit of the Contractor/Subcontractor/Supplier, any surety to any of them or any other third party. The **CONTRACTOR** is not relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals just because the **PROFESSIONAL** approved them.

1.03 SUBMITTAL CLASSIFICATION

Submittals are classified as **OWNER**/**PROFESSIONAL** Approved (OA) and For Information Only (FIO).

1.04 PREPARATION OF SUBMITTALS BY CONTRACTOR

A. The **CONTRACTOR** shall submit stamped/certified submittals to indicate that the submittal satisfies the requirements of the Contract Documents before submission to the **PROFESSIONAL**.

B. Determine and verify all field measurements, quantities, dimensions, instructions for installation and handling of equipment and systems, installation requirements (including location, dimensions, access, fit, completeness, etc.), materials, color, catalog numbers and other similar data as to correctness and completeness.

C. Review submittal items for legibility, conformance to the Contract Documents, coordination between work items, and completeness according to submittal requirements of each specification section. Certify review by signing transmittal form, and list **CONTRACTOR**'s comments. The **CONTRACTOR** must give the **PROFESSIONAL** specific written notice of any variation from the requirements of the Contract Documents.

D. Provide the following information on the transmittal for each submittal:

1. Date of submittal.
2. Project name, contract no., and location.

3. Submittal no., in sequence, beginning with 1.
4. **CONTRACTOR'S** name, address, and contact person.
5. Items within submittal, numbered in sequence.
6. Specification sections number.
7. Manufacturer/designer/supplier.
8. Special instructions (when response is needed, if there is a deviance, etc.).
9. Signature certifying that the **CONTRACTOR** has reviewed the submittal.

E. Cross-reference actual items in submittal by labeling them clearly by item number listed in transmittal and provide them in the sequence listed.

F. If all the submittal items required for the specification section are not provided or deviate from the Contract Documents, attach a memo explaining when the missing items will be provided.

G. Provide one paper copy and one electronic copy of submittals to the **PROFESSIONAL**. If the **CONTRACTOR** anticipates review will require markup and return of the paper submittal, rather than providing comments via email, then the **CONTRACTOR** shall provide an additional copy for markup and return to **CONTRACTOR**. A legible email copy may be accepted to initiate review, if followed by hard copies.

1.05 SUBMITTAL REVIEW BY PROFESSIONAL

A. Upon receipt, **PROFESSIONAL** will log in submittals, and review for conformance with the design intent. Review is for general conformance with design concept for the project and general compliance with the information given in the Contract Documents.

B. Except for Information Only Submittals, where action and return is required, the **PROFESSIONAL** will review each submittal, mark to indicate action taken, and return within seven calendar days. Record reviews may require longer time when a multi-disciplinary review is required. **PROFESSIONAL** will return submittal review forms and comments to the **CONTRACTOR** via email. **PROFESSIONAL** will log out submittal upon sending comments to **CONTRACTOR**.

C. The **CONTRACTOR** is responsible for any time Delay and any cost incurred by the **PROFESSIONAL**, **CONTRACTOR** or Subcontractors/Suppliers as a result of resubmissions and re-reviews of a particular Submittal. The **CONTRACTOR** shall revise and correct submittals returned for revision and resubmittal until approval by the **PROFESSIONAL** is achieved.

D. Compliance with the Contract Documents is the **CONTRACTOR**'s responsibility. **PROFESSIONAL** will review shop drawings solely for general conformance with design concept, and not for the purpose of reviewing or approving their accuracy, completeness, dimensions or quantities, constructability, performance, compatibility with other construction components, or their compliance with the requirements of the Contract Documents, such as Buy America requirements, all of which remain the responsibility of the **CONTRACTOR**. **PROFESSIONAL**'s review also is not for the purpose of reviewing or approving the **CONTRACTOR**'s safety precautions or construction means, methods,

techniques, sequences or procedures.

E. The **PROFESSIONAL** will stamp each submittal with a uniform, action stamp. The **PROFESSIONAL** will mark the stamp appropriately to indicate the action taken, as follows:

1. Approved for General Conformance with Design Concept: When the **PROFESSIONAL** marks a submittal "Approved for General Conformance with Design Concept," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents.

2. Approved, As Noted, for General Conformance with Design Concept: When the **PROFESSIONAL** marks a submittal "Approved, As Noted, for General Conformance with Design Concept," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.

3. Revise and Resubmit: When the **PROFESSIONAL** marks a submittal "Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay.

    a. Do not use, or allow others to use, submittals marked "Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

4. Rejected: When the **PROFESSIONAL** marks a submittal "Rejected" do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Prepare a new submittal according to the notations; resubmit without delay.

    a. Do not use, or allow others to use, submittals marked "Rejected" at the Project Site or elsewhere where Work is in progress.

5. Not Subject to Review: Where a submittal is FIO or for information or record purposes or special processing or other activity, or otherwise does not require **PROFESSIONAL** review and approval, the **PROFESSIONAL** will return the submittal cover sheet marked "Not Subject to Review."

6. Requires Review and Approval by General Contractor: When a submittal does not indicate that it has been reviewed and approved by the General Contractor, the **PROFESSIONAL** will return the submittal marked "Requires Review and Approval by General Contractor." Do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity.

    a. Do not use, or allow others to use, submittals marked "Requires Review and Approval by General Contractor" at the Project Site or elsewhere where Work is in progress.

F. The approval of submittals by **PROFESSIONAL** shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing, and other information are satisfactory. Approval will not relieve the **CONTRACTOR** of the responsibility for any error, which may exist. Neither the **PROFESSIONAL**'s authority to review any of the Submittals by the **CONTRACTOR**, nor the **PROFESSIONAL**'s decision to raise or not to raise any objections about the Submittals, creates or imposes any duty or responsibility on the **PROFESSIONAL** to exercise any such authority or decision for the benefit of the Contractor/Subcontractor/Supplier, any surety to any of them or any other third party. The **CONTRACTOR** is not relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals just because the **PROFESSIONAL** approved them.

G. Reservation of Rights - **PROFESSIONAL** reserves the right to require the **CONTRACTOR** to resubmit any item found not to comply with the Contract. This does not relieve the **CONTRACTOR** from the obligation to furnish material conforming to the plans and specifications and will not prevent the **PROFESSIONAL** from requiring removal and replacement if nonconforming material is incorporated in the Work. This does not relieve the **CONTRACTOR** of the requirement to furnish samples for testing by **PROFESSIONAL** in those instances where the Contract Documents so prescribe. Additional time and expense necessary to comply with additional resubmittals required under this paragraph will not be the basis for any claims for time extension, delay, or extra cost on the part of the **CONTRACTOR**.

1.06 SCHEDULING

A. All scheduling of site work must be done in coordination with the Fort Custer Range Control and coordinated around training and in accordance with Division 0.

B. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with pertinent drawings shall be so scheduled.

C. The **CONTRACTOR** shall provide submittals to the **PROFESSIONAL** in a timely manner that allows for reasonable review cycles, and shall be consistent with the overall construction schedule.

D. No claims for schedule delays will be allowed for unresponsive submittals or failure to respond to comments in a timely manner by **CONTRACTOR**.

E. No work shall commence until all applicable **OWNER/PROFESSIONAL** Approved submittals have been approved.

1.07 DELIVERY OF SUBMITTALS

The schedule of values, project work plan, list of subcontractors, project schedule, health and safety plan (HASP), disposal facilities, and permits shall be submitted to the **PROFESSIONAL** within one

week after Notice to Proceed. All other submittals shall be submitted as specified within each Section of the Contract Documents.

1.08 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the Work will not be made if required approvals have not been obtained. Additional time and expense necessary to comply with additional resubmittals required under this paragraph will not be the basis for any claims for time extension, delay, or extra cost on the part of the **CONTRACTOR**.

1.09 LIST OF SUBMITTALS

Pre-construction submittals shall include but are not limited to the following. Submittal classifications are also provided:

1. Pre-Work Photos of site: FIO
2. Schedule of Values: OA
3. Project Work Plan: OA
4. Site Plan: OA
5. Project Schedule: OA
6. List of subcontractors: OA
7. HASP: FIO
8. Disposal facilities and licenses: OA
9. Weigh scale certification: FIO
10. Permit Applications and Permits: FIO
11. Decontamination Plan: OA
12. Transportation route to disposal facility: OA
13. Spill Contingency Plan: OA
14. Dust Control and Air Monitoring Plan: OA
15. Soil Erosion and Sedimentation Control Plan: OA
16. Backfill sand test results: OA
17. Top soil test results: OA
18. Seed mix: OA
19. Submittals as outlined in all Sections.

Other submittals after starting construction shall include, but are not limited, to the following. Submittal classifications and section references are also provided:

1. Daily site activity reports, submitted weekly: FIO
2. Waste characterization/analytical data: FIO
3. Manifests and disposal tickets: OA
4. Weigh tickets: FIO
5. Notice of Substantial Completion: FIO
6. Notice of Final Completion: FIO
7. Submittals as outlined in all Sections.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01352

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

This Section provides minimum guidance and implementation of a site safety and accident prevention program for the employees of the Contractor and for the preparation of a Health and Safety Plan (HASP). The HASP shall be submitted to the **PROFESSIONAL** for information only. Approval shall not be required. The information and requirements identified in this section are the minimum requirements. The **CONTRACTOR** shall evaluate the work conditions and implement appropriate measures to protect the workers, environment, and public.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-02	(1993) 1993-1994 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, or most recent revision

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1	(1990) Emergency Eyewash and Shower Equipment, or most recent revision

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR Part 1910	Occupational Safety and Health Standards
29 CFR Part 1910.120	Hazardous Waste Site Operations and Emergency Response
29 CFR Part 1926	Safety and Health Regulations for Construction
49 CFR Part 171	General Information, Regulations, and Definitions
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, or most recent revision

1.03 SUBMITTALS

The following submittals are required for information only. The **OWNER** and **PROFESSIONAL** reserve the right to request for additional pertinent information.

A. Record of each entry into and exit from the site.

B. Health and Safety Plan.

C. Qualifications and experience of the Site Safety and Health Officer (SSHO), Safety Health Manager (SHM), and Competent Person for excavation work.

D. Name, phone number, and address of the individual responsible for responding to MIOSHA inquiries.

E. Proof of Employee Training: Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-Hour, annual 8-hour updates, and medical surveillance certifications.

1.04 REGULATORY REQUIREMENTS

A. Work performed under this contract shall conform to all applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to, Occupational Safety and Health Administration (OSHA) standards, 29 CFR Part 1910, and 29 CFR Part 1926. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations and referenced documents vary, the most stringent requirements shall apply.

B. The **CONTRACTOR** is responsible for performing air monitoring and sampling as required. The Contractor shall contact the EGLE - Air Quality Division for guidance, if necessary.

C. The **CONTRACTOR** is responsible for selecting the proper personal protective equipment.

D. The **CONTRACTOR** is responsible for the proper disposal of all personal protective equipment. Disposal of personal protective equipment is incidental to the project.

E. The **CONTRACTOR** is responsible for providing proper training and applicable medical surveillance for all employees scheduled to perform Work at the site.

1.05 HEALTH AND SAFETY PLAN

A. Preparation and Implementation

A HASP shall be prepared covering onsite work to be performed by the **CONTRACTOR** and all subcontractors. The Safety and Health Manager shall be responsible for the development, implementation, and oversight of the HASP. The HASP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The HASP shall address site-specific safety and health requirements and procedures, based upon site-specific conditions. The level of detail provided in the HASP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial HASP is prepared and submitted. Therefore, the HASP shall address, in as much detail as possible, anticipated tasks, their related hazards, and anticipated control measures.

B. Availability

The HASP shall be made available in accordance with 29 CFR Part 1910, Section .120 (b)(1)(v) and 29 CFR Part 1926, Section .65 (b)(1)(v).

C. Elements

Topics required by 29 CFR Part 1910, Section .120 (b)(4) and in 29 CFR Part 1926, Section .65 (b)(4) shall be addressed in the HASP. Where the use of a specific topic is not applicable to the project, the HASP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic. The HASP should include, but is not limited to, the following sections:

1. Site description and contamination characterization
2. Hazard/risk analysis
3. Staff organization, qualifications, and responsibilities
4. Training
5. Personal protective equipment
6. Medical surveillance
7. Exposure monitoring/air sampling program
8. Heat and cold stress monitoring
9. Safety procedures, engineering, controls, and work practices
10. Confined spaces
11. Site control measures
12. Personal hygiene and decontamination
13. Equipment decontamination
14. Emergency equipment and first aid requirements
15. Emergency response and contingency
16. Certificate of worker/visitor acknowledgment
17. Inspection
18. Safety and health phase-out report

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 TRAINING AND MEDICAL SURVEILLANCE

All workers shall have current OSHA 40-hour Hazardous Waste Operations and Emergency Response Training and medical surveillance as applicable per 29 CFR 1910.120.

3.02 FIRST AID AND EMERGENCY RESPONSE EQUIPMENT AND PROCEDURES

A. The **CONTRACTOR** shall provide for appropriate emergency first aid equipment (including ANSI-approved eyewash stations, a portable stretcher, and an industrial-type first aid kit) suitable for treatment of exposure to site physical and chemical hazards.

B. Additionally, two ABC rated fire extinguishers shall be maintained onsite, as well as absorbent material of sufficient quantity to collect any spill, which might occur during this project.

C. A listing of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts shall be posted at the site. A route map detailing the directions to the nearest hospital shall also be posted.

3.03 HEAT AND COLD STRESS

The **CONTRACTOR** shall monitor all personnel for signs of heat or cold stress, as dictated by weather conditions. In addition, all field personnel shall be instructed to observe the symptoms of heat or cold stress in themselves and fellow workers and methods to control them. The **CONTRACTOR** shall adhere to guidelines provided in the Threshold Limit Values and Biological Exposure Indices published by the ACGIH for heat and cold extremes.

3.04 ILLUMINATION

Work areas shall be illuminated to a minimum of 10 foot-candles. Lighting shall be sufficient to determine whether material spills have occurred.

3.05 ELECTRICAL SAFETY

All electrical services must be grounded and be equipped with and utilize ground fault circuit interrupter (GFCI) protected outlets. Portable lights used in the path of possible vapor travel shall be suitable for hazardous locations and shall be connected to extension cords equipped with connectors or switches approved for hazardous locations. Such equipment, when used, shall be thoroughly inspected to be sure it will not be a source of ignition. All air monitoring instrumentation shall be rated as intrinsically safe for CLASS I, DIVISION I, GROUP D atmospheres.

3.06 SITE CONTROL AND WORK ZONES

Personnel not directly involved with this project shall not be permitted to enter the Work Zone. For purposes of this Contract, the "Work Zone" shall encompass the entire site. The initial minimum level of personal protective equipment shall be in accordance with these Specifications. The boundary of the Work Zone shall be clearly demarcated and posted by the **CONTRACTOR**.

3.07 CONFINED SPACES

All confined space work shall be conducted in strict conformance with 29 CFR 1926, Subpart AA.

3.08 COMBUSTIBLE GAS/OXYGEN MONITORING

A. Oxygen levels shall be monitored in sewers/trenches/excavations prior to allowing workers to enter, and continuously during the time the workers are present in these spaces. Any reading less than 19.5% or greater than 23% oxygen shall prevent the workers from entering until the situation is resolved and retesting indicates the space is safe for entry. Resolution of these hazardous situations may require forced ventilation of the space.

B. Appropriate gas detector(s) shall be utilized to monitor the Lower explosive limit (LEL) levels in sewers/trenches/excavations prior to allowing workers to enter, and continuously during the time the workers are present in these spaces.

C. Any combustible gas/oxygen monitor, provided it complies with these Specifications, may be selected. The combustible gas indicator shall be calibrated, checked, and maintained daily, in accordance with manufacturer's directions.

3.09 AIR MONITORING AND SURVEILLANCE

When personnel are working in confined spaces, within sewers/trenches/excavations or other spaces suspected of potential hazardous conditions, the **CONTRACTOR** shall implement routine air surveillance and monitoring for oxygen levels. Air monitoring and surveillance shall be required whenever personnel enter a sewer/trench/excavation or whenever site conditions indicate that organic vapors may be present. Air monitoring, when conducted, shall be performed in the breathing zone of the personnel. Air monitoring and surveillance equipment and action levels shall be described in the Site Health and Safety Plan.

3.10 EXCAVATION SAFETY

All excavation work shall be conducted in strict conformance with, at a minimum, Sections 18 and 23 of EM 385-1-1 and 29 CFR 1926.650 through 29 CFR 1926.653, including requirements for sloping or shoring found in 29 CFR 1926.652. If the excavation must remain open during periods when the work site is unoccupied, barricades shall be placed around the excavation in such a manner to alert personnel to the danger and prevent them from falling into the excavation.

3.11 EATING, DRINKING, SMOKING

No eating, drinking, smoking, chewing of tobacco or gum, or other hand-to-mouth activities shall be permitted in any of the work areas during the course of this project.

3.12 BREAK AREA AND SUPPORT ACTIVITIES

All eating, drinking, smoking, and break facilities, as well as the **CONTRACTOR**'s equipment storage, parking, and office shall be located outside the Work Zones, as determined by the Site Safety Officer and approved by the **PROFESSIONAL**.

3.13 SANITATION

The **CONTRACTOR** shall ensure that all onsite personnel have ready access to soap and clean water, and to toilet facilities, as required by Section 3 of EM 385-1-1.

3.14 BIOLOGICAL HAZARDS

The **CONTRACTOR** shall implement measures to minimize the spread of COVID-19 and any other biological hazards. All site personnel shall comply with OSHA, CDC, State of Michigan, and local requirements, current at the time the work is being performed.

3.15 UNFORESEEN HAZARDS

Should any unforeseen or site-specific safety-related factor hazard, or condition become evident during the performance of work at this site, it shall be the **CONTRACTOR**'s responsibility to bring such conditions to the attention of the **PROFESSIONAL**, both verbally and in writing, as quickly as possible for resolution. In the interim, the **CONTRACTOR** shall take prudent action to establish and maintain working conditions and to safeguard employees, the public, and the environment.

3.16 TERMINATION

Any disregard for the provisions of these Specifications or applicable regulations shall be deemed just and sufficient cause for termination of the **CONTRACTOR** or any Subcontractor without compromise or prejudice to the rights of the **CONTRACTOR**.

END OF SECTION

SECTION 01354

HAZARDOUS MATERIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 GENERAL

A. The Contractor must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous in accordance with all Federal, State and local Laws. If the Contractor encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the Contractor must immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions.

B. This project has materials when removed off-site could be classified as hazardous waste, which shall be transported and disposed off-site in a licensed facility in compliance with applicable regulations, to complete the Work, as described in the Contract Documents.

C. Environmental Hazards are regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) - Materials Management Division (MMD), and Remediation and Redevelopment Division (RRD), in carrying out the requirements of the United States Environmental Protection Agency (EPA).

D. The Michigan Occupational Safety and Health Administration (MIOSHA) provides regulations for the safety and health of workers.

1. Contractor shall post any applicable local, State and/or Federal government regulations at the job site in a prominent location.

2. Contractor shall be responsible for training their workers in safe work practices and proper removal methods when encountering hazardous chemicals.

E. Applicable regulations, include, but are not limited to:

State

1. Michigan Natural Resources and Environmental Protection Act – PA 451 of 1994, as amended:
   a) Part 211 - Underground Storage Tanks.
   b) Part 213 - Leaking Underground Storage Tanks
   c) Part 111 - Michigan Hazardous Waste Management Act
   d) Part 115 - Solid Waste Management
   e) Part 121 - Liquid Industrial By-products
   f) Part 147 - PCB compounds

2. All applicable MDOT regulations.

Federal

1. RCRA, 1976 - This Federal statute regulates generation, transportation, treatment, storage, or disposal of hazardous wastes nationally.

2. Toxic Substances Control Act (TSCA), 1976: This statute regulates the generation, transportation, storage, and disposal of wastes, including polychlorinated biphenyls and asbestos.

F. Definitions: Hazardous substances are ignitable, corrosive, reactive, and/or toxic, based on the respective chemical characteristics. Wastes are hazardous based on characteristics or by being a listed waste.

G. Disposals:

1. To use an off-site hazardous waste disposal facility, the Contractor must use the Uniform Hazardous Waste Manifest (shipping paper).

2. Hazardous waste may not be disposed in sanitary landfills used for solid waste.

H. Federal, State, and local laws and regulations may apply to the storage, handling, and disposal of hazardous materials and wastes. The list below includes the regulations that are most frequently encountered.

Topic	Agency
Small quantity hazardous waste management, including hazardous waste stored in tanks	EGLE EAC or District Office
Liquid industrial waste disposal (hazardous and non-hazardous)	EGLE EAC, or District Office
Disposal of hazardous waste into municipal sanitary sewers	Contact the superintendent of the local wastewater treatment plant for permission
Discharges to surface water such as through a drain pipe or wastewater discharge	Water Resources Division – 269-567-3500 EGLE EAC, or District Office
Discharges to groundwater, including septic systems	EGLE EAC, or District Office, or Health Department 269-621-3143
Material storage permits	EGLE EAC, or District Office

Pollution Incident Prevention Plans (PIP Plans)	EGLE EAC, or District Office County Health Departments assisting with ground-water program administration
Hazard Communication Standards (for chemicals in the work place)	Michigan Department of Licensing and Regulatory Affairs, Michigan Occupational Safety & Health Administration Consultation Education & Training Division
Burning of waste oil and other discharges to the air	Air Quality Division EGLE EAC, or District Office
24-hour EGLE Pollution Emergency Alerting System (PEAS)	1-800-292-4706
Registration of underground fuel storage tanks	EGLE EAC, or District Office
Installation, inventory, testing and other requirements for above ground and underground storage tanks (for flammable and combustible liquids)	EGLE EAC, or District Office
Local fire prevention regulations and codes (including chemical storage requirements)	Local fire chief or fire marshal Paw Paw Village Fire Dept 269-657-3148
Building and outdoor storage requirements (including setbacks)	Local government building or zoning official

I. EGLE District Office

Michigan Department of Environment, Great Lakes, and Energy
Kalamazoo District Office
7953 Adobe Road
Kalamazoo, Michigan 49009
269-567-3500

J. NPDES Permit EGLE Contact

Jeremy Rubio
Environmental Quality Analyst
Water Resources - Kalamazoo District Office
269-568-3394

K. Contact the Environmental Assistance Center (EAC) of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) at 1-800-662-9278, or e-mail to: EGLE-Assist@Michigan.gov for general EGLE information including direct and referral assistance on air, water and wetlands permits; contaminated site clean-ups; underground storage tank removals and remediation; hazardous and solid waste disposal; pollution prevention and recycling; and compliance-related assistance. The Center provides businesses, municipalities, and the public with a single point of access to EGLE's environmental programs.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 PURPOSE

Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

1.02 TESTING AND INSPECTIONS SERVICES

A. Any sampling and analytical services that are required during the construction activities in order to conform to Health and Safety requirements, shall be provided by the **CONTRACTOR** at no extra cost to the project.

B. The **PROFESSIONAL** shall provide the following services:

1. Observe on-site progress.
2. Review quantity measurements for payment.
3. Photograph construction progression.
4. Document that the project has been completed according to the Contract Documents.
5. Evaluate the data received from the **CONTRACTOR'S** testing laboratory.
6. Verification sampling as appropriate.

C. The **CONTRACTOR'S** services shall be performed in accordance with requirements of all applicable local, State, and Federal regulations as stated throughout the Contract Documents.

D. Laboratory Services: All required analyses shall fulfill EPA, ASTM, EGLE, ANSI, and other standards for testing. Submit a copy of each analytical report to the PROFESSIONAL for evaluation and subsequent distribution within two days of receipt.

E. **CONTRACTOR** shall cooperate with the **PROFESSIONAL** and furnish tools, samples of materials, equipment, storage, and assistance, as requested. Contractor shall assist **PROFESSIONAL** in the collection of samples as necessary.

F. The **CONTRACTOR** shall notify the **PROFESSIONAL** 48 hours prior to the anticipated start of operations requiring testing services or requiring the **PROFESSIONAL'S** presence at the site for coordinating certain activities.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

Upon completion of inspection, testing, sampling, and similar services performed on the Work, the **CONTRACTOR** shall repair damaged Work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finishes. The **CONTRACTOR** shall protect Work exposed by or for quality control service activities and protect repaired Work. Repair and protection is the **CONTRACTOR**'s responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

The **CONTRACTOR** must furnish and install all temporary facilities and controls required by the Work, must remove them from the site upon completion of the Work, and the grounds and existing facilities must be restored to their original condition. The **CONTRACTOR** shall provide and install construction facilities which include, but not limited to, temporary utilities, sanitary facilities, and storage facilities. All costs associated with this Section are incidental to the project.

1.01 TEMPORARY UTILITIES

A. The **CONTRACTOR** shall furnish and install all temporary utilities and controls required by the Work, shall remove these from the property upon completion of the Work, and the grounds and existing structures shall be restored to their original condition. Temporary utilities may include, but not limited to, electricity, lighting, ventilation, and water.

B. The **CONTRACTOR** shall pay for cost of installation and removal of any temporary connections, including necessary safety devices and controls.

1.02 SANITARY FACILITIES

A. The **CONTRACTOR** must provide and maintain a sufficient number of portable temporary toilets in locations approved by the **OWNER** and in compliance with all Federal, State and local code requirements. The Contractor must maintain the temporary toilets in a sanitary condition at all times and must remove these when the Work under this Contract is complete.

B. The **CONTRACTOR** is responsible for all fees associated with providing and maintaining all sanitary facilities on a regular basis, and removal of facilities upon construction completion.

1.03 STORAGE FACILITIES

A. At the beginning of the Work, the **CONTRACTOR** may provide a field office and storage building at the site in a location acceptable to the **OWNER**. The building may be a trailer. The Contractor may provide such other temporary buildings as required for the use of workers and safe storage for tools and materials. Job signs with the **CONTRACTOR**'s name, logos, specialty, etc., are not allowed.

B. The **CONTRACTOR** shall be responsible for providing and maintaining storage facilities for storm water and other water generated and/or collected onsite, and other project related materials and items.

PART 2 PRODUCTS

2.01 MATERIALS

A. All equipment and facilities shall be furnished in compliance with federal, state, and local requirements, including OSHA.

B. The Contractor shall provide sufficient drinking water and sanitation facilities for all employees and site visitors.

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01550

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 ACCESS ROADS AND PARKING

A. Prior to commencing work, Contractor is responsible for either videotaping or photographing the existing roads, curbs, parking areas, fences, and structures to record the existing conditions. Any damage caused by the Contractor's work activities shall be repaired by the Contractor at no cost to the Owner.

B. The Contractor shall construct temporary access roads and parking areas necessary for proper execution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. Temporary roads and parking areas shall be designed and maintained by the Contractor, so as to be fully usable in all weather conditions. Stabilized gravel drives and tire wash shall be installed as needed to eliminate dirt tracking into public roads.

C. Contractor employee parking shall not interfere with the progress of work. Vehicles leaving the construction site that become contaminated while within the construction site shall be decontaminated prior to leaving the site. Vehicles specified by the Professional shall be decontaminated and shall not leave the site without authorization of the Professional.

D. Temporary access roads and parking areas shall be removed by the Contractor prior to final acceptance, unless otherwise required by the Contract Documents.

E. All costs associated with this Section are incidental to the project.

1.02 MAINTENANCE OF CONSTRUCTION AREA

A. Construction fencing shall be kept in a state of good repair and proper alignment.

B. Should the Contractor elect to traverse grassed or unpaved areas which are not established roadways with construction equipment or other vehicles, such areas shall be covered with a layer of gravel or equipment mats, as necessary, to prevent rutting and the tracking of mud onto paved or established roadways. Gravel gradation shall be at the Contractor's discretion.

C. All costs associated with this Section are incidental to the project.

1.03 PROTECTION AND MAINTENANCE OF TRAFFIC

A. Contractor shall maintain and protect traffic on all affected roads throughout the construction period, in accordance with local and MDOT ordinances and requirements. If the Work requires roads to be temporarily shutdown, traffic stopped or detoured, the

Contractor shall make arrangements with applicable local and MDOT authorities for permits, permission and proper procedures and required protective measures. Measures for the protection and diversion of traffic include, but are not limited to, the following:

1. Obtain permits as necessary.
2. Provision of watchman and flagmen.
3. Erection of barricades.
4. Placement of lights around and in front of equipment and the work.
5. Erection and maintenance of adequate warning signs such as danger and direction signs.
6. Erection of Slow Moving Trucks Entering Highway or any other signs as required.

The aforementioned and any other measures shall be as required by the State, and local authorities having jurisdiction at the site and for the trucking route.

B. The traveling public shall be protected from damage to person and property. Contractor shall obtain permits, place barricades, install fencing, provide flag persons, and provide necessary provisions to ensure the safety of traveling public adjacent to the site during work.

C. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations. The Contractor shall minimize public road impacts from construction operations.

D. No mud tracking or mud matting will be allowed on any public or private streets. Contractor shall arrange for and supply a street-sweeper/cleaner to maintain the roads on an ongoing basis. The cleaning operation shall be conducted as required and determined by the Professional, and at a minimum as required by the agency or entity having jurisdiction over the roadways.

E. Any required sidewalk and lane closures or work in the public rights-of-way shall be approved by the State, County, Village, Michigan Department of Transportation, and/or any other authorities having jurisdiction. Contractor is responsible for obtaining required permits for work within the public rights-of-way.

F. All costs associated with this Section are incidental to the project.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01571

SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

Pursuant to Part 91 of 1994 PA 451, Soil Erosion and Sedimentation Control (SESC), as amended, the DMVA has established SESC procedures to provide "effective soil erosion and sedimentation control, inspection, enforcement and sediment pollution abatement or prevention". As an Authorized Public Agency (APA), the DMVA is responsible for controlling erosion and offsite sedimentation on all DMVA construction projects, and from applicable military construction training activities at DMVA facilities. This responsibility cannot be transferred to the designer or contractor. However, their contracts (and agreements with other military entities) can include penalties for non-compliance with SESC provisions that are included in the contract documents. To assist DMVA's Construction & Facilities Management Office (CFMO) with ensuring compliance with Part 91 of 1994 PA 451, a SESC Program has been established. The SESC Program incorporates DMVA staff and the procedures in this guidebook for the control of erosion and sedimentation. The SESC Program functions independent of the construction inspection services being provided by the CFMO.

The DMVA, as APA, can issue up to $500 per day plus assessment of actual damage costs for failure to implement the SESC Design and construction contractor prepared and approved SESC Implementation Plan. The fines and fees are for when a contractor refuses to comply with SESC requirements and corrective measures contained in the construction contract. For bonded projects, the Surety Company shall be held responsible for these costs in the event the contractor refuses to perform or is found in default.

Contractors shall ensure their bid includes 1) construction sequencing for SESC, 2) installation, maintenance, and removal of temporary SESC control measures and 3) installation and maintenance of permanent SESC control measures if applicable.

1.01 WORK REQUIRED

A. The Contractor shall furnish, install, and maintain as long as necessary and remove when no longer required, all necessary engineering controls to prevent erosion and sedimentation of onsite soils as required by, and in accordance with Part 91 of P.A. 451 and local soil erosion and sedimentation control permit.

B. The Contractor shall be responsible for all application fees and obtaining a soil erosion and sedimentation control (SESC) permit.

C. The Contractor shall comply with all the requirements of Michigan’s Permit-By-Rule for Construction Activities for site sites with 1 to 5 acres of land disturbance. The requirements include, but not limited to, having SESC measures under the direct supervision and control of a certified storm water operator.

1.02 RELATED SECTIONS

Section 026110- Removal and Disposal of Contaminated Soil
Section 029200- Site Restoration
Section 311100- Clearing and Grubbing
Section 329200- Turf and Grasses

1.03 REFERENCES

The following reference is part of this specification to the extent referenced.

State of Michigan

Part 91 of P.A. 451	Soil Erosion and Sedimentation Control (formerly P.A. 347)
Section 208	MDOT-Standard Specifications for Construction, 2012 Edition
MDMVA	Soil Erosion and Sediment Control Guidebook, October 2018

1.04 SUBMITTALS

A. The submittals identified in this Section shall be submitted to the Professional in accordance with Section 01300-Submittals.

B. Prior to proceeding with site work, the Contractor shall submit to the Professional a Soil Erosion and Sedimentation Control Plan, including sequencing and schedule, for approval by the Professional. The Soil Erosion and Sedimentation Control Plan may be submitted as part of the Project Work Plan. The soil erosion and sedimentation control plan shall be in compliance with the Specifications and the provisions of Part 91 of PA 451. The cost of preparation is incidental to the project. The Plan shall include all the requirements of the State and local SESC permitting agency.

1. The Soil Erosion and Sedimentation Control Plan shall include, but not limited to, the following:

a. Means, methods, procedures, and materials proposed for accomplishment of soil erosion and sedimentation control. The procedures shall provide a detailed description of the methods, equipment, and materials to be used and the sequence and schedule of soil erosion and sedimentation control measures to be implemented at the site.

b. Schedule and sequence for removal of temporary and permanent soil erosion and sedimentation control measures.

2. The SESC plan shall be based on Part 91 of P.A. 451 and the cost of preparation is incidental to the project.

C. Copy of the Soil Erosion and Sedimentation Control Permit issued by the local enforcing agent. The cost of permit application is incidental to the project.

D. Copy of the certification issued by the State of Michigan – EGLE to the Contractor's Certified Storm Water Operator for the site.

PART 2 PRODUCTS

2.01 GENERAL

Materials used for permanent and temporary erosion and sedimentation controls shall meet the requirements as described in these Specifications, Drawings, DMVA's SESC Guidebook, DTMB's Soil Erosion and Sedimentation Control Guidebook dated February 2005, MDOT 2012 Standard Specifications for Construction, and Part 91 of P.A. 451 rules.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for obtaining a Soil Erosion and Sedimentation Control permit, if applicable, prior to any site work.

B. The Contractor shall design and construct terrain features such as slope and drainage ways to minimize the erosion potential of the exposed site based on the soil type, time of year, proximity to water ways, duration of exposure, length and steepness of the slope, and the anticipated volume and intensity of runoff.

C. The Contractor shall minimize the surface area of unstabilized soils left unprotected and vulnerable to runoff and wind at any one time.

D. The Contractor shall minimize the amount of time that unstabilized areas are exposed to erosive forces.

E. The Contractor shall protect and shield exposed soil areas with a cover of live vegetation, mulch, or other approved erosion resistant material during the temporary and permanent control periods of construction.

F. The Contractor shall avoid concentrating runoff. When concentrated runoff cannot be avoided, runoff velocities shall be reduced to non-erosive velocities.

G. Eroded sediments will be trapped onsite with temporary and permanent barriers, basins, or other sediment retention devices while allowing for the controlled discharge of runoff waters at non-erosive velocities.

H. The Contractor shall implement a continuous inspection and maintenance program.

I. The Contractor shall implement and follow the Soil Erosion and Sedimentation Control Implementation Plan during and after the work activities, comply with the permit, and applicable rules.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 MATERIAL AND EQUIPMENT

A. The Contractor must furnish and be responsible for all materials, equipment, facilities, tools, supplies and utilities necessary for completing the Work. All materials and equipment must be provided to complete the work as described in the Contract Documents and of good quality, free of defect and new and must be applied, installed, connected, erected, used, cleaned and conditioned following the manufacturers and Suppliers' instructions. Equipment that may be required to complete the Work includes, but is not limited to:

1. Material Excavation: Excavator with bucket and plate compactor attachments

2. Material Hauling: dump truck, gravel train, flat-bed trailer

3. Material spreading: Bulldozer

B. All materials and equipment delivered to and used in the Work must be suitably stored and protected from the elements. The areas used for storage must only be those approved by the State Agency. The Owner assumes no responsibility for stored material. The ownership and title to materials will not be vested in the Owner before materials are incorporated in the Work, unless payment is made by the Owner for stored materials and equipment. After delivery, before and after installation, the Contractor must protect materials and equipment against theft, injury or damage from all causes. For all materials and equipment, the Contractor must provide complete information on installation, operation and preventive maintenance.

1. The Contractor must cover and protect bulk materials while in storage which are subject to deterioration because of dampness, the weather or contamination. The Contractor must keep materials in their original sealed containers, unopened, with labels plainly indicating manufacturer's name, brand, type and grade of material and must immediately remove from the Work site containers which are broken, opened, watermarked and/or contain caked, lumpy or otherwise damaged materials.

2. The Contractor must keep equipment stored outdoors from contact with the ground, away from areas subject to flooding and covered with weatherproof plastic sheeting or tarpaulins.

3. The Contractor must certify that any materials stored off-site are:

a. Stored on property owned or leased by the Contractor or owned by the agency.
b. Insured against loss by fire, theft, flood or other hazards.
c. Properly stored and protected against loss or damage.
d. In compliance with the plans and specifications.

e. Specifically allotted, identified, and reserved for the project.
f. Itemized for tracking and payment.
g. Subject to these conditions until the items are delivered to the project site.

PART 2 PRODUCTS

2.01 MATERIALS

A. Personnel safety equipment shall be furnished in compliance with federal and state requirements, including OSHA.

B. Materials shall be furnished as specified and as needed to complete the specified work.

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01740

CLEANING

PART 1 GENERAL

1.01 CLEANING

A. Regular Cleaning: Contractor shall remove all scrap or removed material, debris, or rubbish from the project at the end of each workday and more frequently whenever the Professional deems such material to be a hazard. No discarded material shall be deposited on the grounds. No salvage or surplus material may be sold on the premises. The Contractor shall take appropriate efforts so as not to create any nuisance conditions at or around the property. Contractor shall promptly clean areas dirtied by any cause arising from its operations. Contractor shall maintain good housekeeping practices, and comply with local permits and ordinances.

B. Final Cleaning: Just prior to final acceptance by the Owner and Professional, the Contractor shall clean all of the Work and existing surfaces, building elements and contents that were soiled by the operations and make repairs for any damage or blemish that was caused by the Work.

C. The Contractor is responsible for wet vacuum street sweeping on a regular basis, as required by Owner, MDOT or local government, and just prior to final acceptance by the Owner and Professional to control the dust or mud tracking. Contractor shall conduct, at a minimum, weekly street sweeping during entire Work.

D. All related costs associated with regular and final site cleaning are incidental to the project.

1.02 CLEANUP

A. All construction debris and waste materials generated by the Contractor shall be removed from the work site daily. Any dirt or debris tracked onto paved or surfaced roadways shall be cleaned right away. Salvageable uncontaminated or decontaminated materials resulting from removal activities may be stored at the site with approval of the Owner. Materials not stored in trailers, whether new or salvaged, shall be neatly stacked when stored. The related costs are incidental to project.

B. All construction debris, waste materials, rubbish, and excess and/or unsatisfactory materials resulting from the Work and generated onsite shall be completely removed from the site and properly disposed of, unless otherwise specified or directed by the Professional.

C. All related costs associated with site cleanup are incidental to the project.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01780

CONTRACT CLOSE-OUT

PART 1 GENERAL

Division 0 supersedes if more stringent than any of the provisions in this section.

1.01 DESCRIPTION

A. This Section provides the requirements for final closeout of the project, including final review of work, final adjustments of accounts, and as-built drawing review.

B. Substantial Completion shall be defined as the completion of all Contract Items and site work with the exception of demobilization.

C. A Substantial Completion Inspection of the site shall be conducted by the Owner and Professional with the Contractor. Deficiencies identified during the inspection, provided to the Contractor as punch list items, shall be rectified at no added expense to the Owner.

D. Project Closeout Meeting shall be conducted by the Professional, with the Contractor and the Owner, at the end of the work upon completion of punch list items identified in the substantial completion meeting.

1.02 REFERENCES

The following publication forms a part of this specification to the extent referenced. This publication is referred to in the text by its basic designation only.

AMERICAN INSTITUTE OF ARCHETECTS (AIA)

G702, G703 Application and Certification for Payment Form

1.03 SUBMITTALS

A. The Contractor shall provide written notification to the Professional when the project is substantially complete.

B. Upon verification of Substantial Completion by the Owner and Professional, the Contractor shall sign a Certificate of Substantial Completion for the Contract Work (Form: DMB-445). This form must be dated to reflect the actual date of Substantial Completion.

C. The Contractor shall provide written notification to the Professional when the project is complete in accordance with contract documents and is ready for final review.

D. If the project is bonded, the Contractor shall provide consent to make final payment from the bonding company with power of attorney.

E. The Contractor shall submit a final statement of accounting for all contract quantities to the Professional.

F. The Contractor shall submit a Final Application for Payment to the Professional, as detailed in Subsection 3.05 Final Application for Payment.

G. The Contractor shall submit to the Professional, a completed Guarantee and Statement form (DMB-437) with the Final Application for Payment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SUBSTANTIAL COMPLETION

A. The Contractor must notify the Professional that the project is substantially complete.

B. The Professional will schedule the Substantial Completion Inspection upon receipt of notification from the Contractor. The Contractor must be represented on the job site at the time this inspection is made.

C. Upon inspection, should the Owner and Professional consider the work substantially complete:

1. The Professional shall prepare and provide to the Contractor, a punch list of minor items to be completed or corrected, as determined by the inspection.
2. The Professional will complete and sign a Certificate of Substantial Completion of Contract Work and provide it to the Contractor for signature. This form shall include the Contractor's punch list, as amended by the Professional.
3. The Contractor shall complete the work listed for completion or correction within seven calendar days or as otherwise agreeable to the Owner and Professional.
4. Two hundred percent (200%) of the value of all punch list items will be withheld from payment and will be paid to the Contractor upon final completion, as part of the Final Application for Payment.

D. Upon inspection, should the Owner and Professional consider the work not substantially complete:

1. The Professional shall notify the Contractor immediately, in writing, identifying the work is not substantially complete.
2. The Contractor shall then complete the work and send a new written notice to the Professional certifying that the project is substantially complete.

3. The Owner and Professional will again review the work to verify if it is substantially complete.

3.02 FINAL REVIEW

A. The Contractor must notify the Professional that the Work has been completed in accordance with Contract Documents, and the project is ready for final review.

B. The Owner and/or Professional shall conduct a final review and provide any comments to the Contractor within seven calendar days after performance of the final review.

C. Should the Owner and Professional consider that the work is finally complete in accordance with the requirements of Contract Documents, the Professional will request that the Contractor submit the project closeout documents to Professional.

D. Should the Owner and Professional consider that the work is not finally complete:

1. The Professional will notify Contractor, in writing, identifying what work is not finally complete.
2. Contractor shall take immediate steps to remedy the stated deficiencies and send a new written notice to the Professional certifying that the work is complete. The Owner and/or Professional will again review the work for final completion.

3.03 CLOSE OUT SUBMITTALS

The Contractor shall submit completion notifications, guarantees and statements, other warranties, Consent of Surety, all manifests and weight tickets not previously submitted, laboratory analytical data, compaction testing results, air monitoring report not previously submitted, as-built drawings, etc. to the Professional.

3.04 FINAL ADJUSTMENTS OF ACCOUNT

A. Submit final statement of accounting for all contract quantities to the Professional.

B. Statement shall reflect all adjustments, including:

1. Original Contract Sum
2. Additions and deductions resulting from:
    a. Previous Contract Change Orders
    b. Cash Allowances
    c. Work not performed and other adjustments
    d. Deductions for uncorrected work
    e. Deductions for liquidated damages
3. Total Contract Sum, as adjusted
4. Previous payments
5. Sum due to the Contractor

C. The Professional will process a final Change Order Request, reflecting approved adjustments to Contract Sum not made previously by Change Orders.

3.05 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the following to the Professional as final application for payment:

1. Written notification that the project is complete.
2. Application and Certification for Payment form (AIA Documents G702 and G703, or equivalent).
3. Consent of Surety to final payment with power of attorney.
4. Guarantee and Statement (Form DMB-437) from Contractor guaranteeing site work for one year from the date of Substantial Completion, for all work completed through Substantial Completion. A separate one-year guarantee period maybe established for seeding, depending on the completion date of associated activities.
5. Certificate of Substantial Completion (Form DMB-445) of Contract Work form. This form must be dated to reflect actual date of substantial completion and signed by an authorized representative of the Contractor.

B. Upon receipt of application for final payment, the Professional will review the application to determine if the project is substantially complete. If so determined, within seven calendar days, the Professional will recommend final payment by the Owner or provide the Contractor with written notice stating why the request was not recommended for payment.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 02 61 00

REMOVAL AND DISPOSAL OF CONTAMINATED SOIL

PART 1 GENERAL

1.01 WORK INCLUDED

A. Excavate, remove, transport, and dispose contaminated soils on face of the backstop berm at Range 5 as identified in the contract documents, and as directed by the Professional and Owner.

B. Contract drawings identify the areas and the estimated depth of the excavation. Contractor shall implement appropriate excavation, and other practices maintaining the structural integrity of the berm.

C. Characterize the soils that are to be removed from the berm, as required by the receiving facility and obtain approval from the receiving facility(s).

D. General backfilling, leveling, and compacting.

E. Repair and restore the berm face immediately after excavation is complete.

F. Sampling and testing of backfill materials are the responsibility of the Contractor**.**

1.02 RELATED SECTIONS

A. Section 01300-Submittal Procedures

B. Section 01571-Soil Erosion and Sedimentation Control

C. Section 01740-Cleaning

D. Section 028100- Offsite Transportation and Disposal

1.03 REFERENCES

The following publication of the issue listed below forms a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

MDOT	Standard Specifications for Construction, 2012 Edition
ASTM D 2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods
ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

OSHA	1926 Subpart P – Excavations
US DOD	Unified Facilities Criteria (UFC) Small Arms Ranges UFC 4-179-02

1.04 DEFINITIONS

A. Competent Person: Competent Person is an individual who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA 29 CFR 1926.650. It is the responsibility of the Contractor to have a Competent Person at the site during the excavation and related activities.

1.05 TESTS

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner. Testing shall be performed by an approved commercial testing laboratory or may be performed by the Contractor, subject to approval by the Professional and Owner.

A. The Contractor shall characterize for disposal all excavated contaminated soils, and miscellaneous debris, as required by the disposal facility.

B. One gradation test and one modified proctor test of backfill sand to verify modified MDOT Class II classification with 100% passing through #4 sieve.

C. One sample of the backfill sand shall be collected and analyzed for Michigan 10 metals, DRO, GRO, ORO, and PFAS (40 compound list). Sample collection shall be coordinated with the Professional and split sample with the Professional at the time of sample collection. Sample results shall be submitted prior to mobilization.

D. One sample of the top soil shall be collected and analyzed for Michigan 10 metals, DRO, GRO, ORO, and PFAS (40 compound list). Sample collection shall be coordinated with the Professional and split sample with the Professional at the time of sample collection. Sample results shall be submitted prior to mobilization.

1.06 SUBMITTALS

A. Project Work Plan

Procedures, methods, materials, and other information regarding excavation and backfill shall be included in the Project Work Plan developed by the Contractor, as specified in Section 01300-Submittal Procedures. The Contractor shall implement and maintain the work plan for all site activities as part of this work. The cost of work plan preparation is incidental to the project. No adjustment for time or money will be made for resubmittals required as a result of noncompliance. The following information regarding excavation and backfilling shall be included in the Project Work Plan, at a minimum:

1. Project Schedule
2. List of Subcontractors
3. Description of the methods and equipment to be used for each related operation (i.e., excavation, transportation, sampling, etc.).
4. Temporary storage for stockpiled contaminated soil – If needed
5. Transportation company
6. Disposal facilities
7. Method to protect any storm sewers and conveyances during soil excavation in close proximity of the site.
8. Description of the means, methods, and procedures for site restoration.
9. Identify competent person as defined by OSHA, and provide qualifications.
10. Waste characterization sample results.
11. Backfill sand gradation results.
12. Backfill sand sample analytical results.
13. Top soil sample analytical results.

B. Backfill Material

Virgin fill sand must be used. The source of the fill must be identified, reviewed and approved by the Owner prior to work starting. The Contractor shall submit data on proposed backfill material to the Professional and Owner for approval. In addition, backfill data shall include grain size analysis, including MDOT Class II classification with 100% passing through #4 sieve.

C. Topsoil

Virgin screened topsoil must be used. The Contractor shall submit data on proposed topsoil material to the Professional and Owner for approval. This data shall include the source of the topsoil and certification that the material is from a virgin source and is not contaminated. The proposed topsoil source must be reviewed and approved by Owner prior to placing topsoil at the site.

D. Berm Soil Analytical Reports

The Contractor shall submit to the Professional all the sample analytical results of the waste characterization, in obtaining disposal facility approvals.

E. Fill Material Analytical Reports

The Contractor shall submit to the Professional all analytical results of the of the backfill sand and top soil samples prior to bringing the material on-site. The fill sand and top soil samples shall be analyzed for Michigan 10 metals, DRO, GRO, ORO, and PFAS (40 compound list).

F. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as approved by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts and manifests to the Professional at the end of each day that material is shipped offsite and upon request.

G. Daily Site Activity Reports

The Contractor shall submit its Daily Site Activity Reports to the Professional, on a weekly basis and upon request.

1.07 PROJECT COORDINATION

A. The Contractor shall carefully coordinate the work in this Section with all other work. The work shall be compliant with Occupational Safety and Health Administration (OSHA) regulations and other applicable safety requirements.

B. The Contractor shall verify utility line locations that are in close proximity to the work areas. Utility lines may include, but are not limited to, the following: telephone, cable, electric, water, sewer, fiber optic, and gas lines. Contractor shall take precautions to protect all utilities and is responsible for the repair/replacement of any damages caused by the Contractor at no cost to the Owner. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to, gas, electric, water, sanitary sewer and storm sewer. Contractor shall coordinate with the utility companies of all utilities within or in close proximity of the excavations.

PART 2 PRODUCTS

2.01 MATERIALS

A. All backfill materials are subject to the approval of the Professional and Owner.

B. Contaminated soils - Contaminated soil includes, but is not limited to: soil, and other contaminated materials excavated from the berm, as described in the specifications.

C. Uncontaminated soils - Uncontaminated soil includes uncontaminated soil material removed from the excavation as screened and approved by the Professional for use as backfill.

D. Backfill material - Satisfactory materials shall be from a virgin source and shall be MDOT Class II granular material modified with 100% passing through #4 sieve, and shall be free of trash, debris, roots, other organic matter, slag, and crushed concrete.

E. Topsoil – Topsoil shall be sourced from a virgin source, and shall be screened, free of contaminants, stones, stumps, lumps and similar objects larger than 2-inches in diameter.

PART 3 EXECUTION

3.01 PREPARATION

A. Excavation and associated activities shall be conducted in the areas identified in the figures and as directed by the Professional.

B. The Contractor shall take extreme care during the site activities to prevent cross contamination. Adequate measures shall be taken to prevent surface water from entering Work areas.

C. The Contractor shall contact MISS DIG, other applicable local utility companies/authorities for utility identification a minimum of three workdays prior to any excavations. The Contractor shall comply with 1974 PA 53, as amended, MCL 460-701 et seq., and all other laws concerning underground utilities. The Contractor shall contact Fort Custer public works for private utility identification, a minimum of seven days prior to any excavations The Contractor shall verify that all utility lines in close proximity to the Work areas are properly identified, marked, and protected, or capped, as applicable. Contractor shall notify Miss Dig of overhead electric lines where 10-foot clearance could not be maintained.

D. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to, cable, gas, electric, water, sanitary sewer and storm sewer.

E. Personnel working inside and around the excavation areas shall be trained and thoroughly familiar with the safety precautions and equipment required for controlling potential hazards associated with the Work.

F. As applicable, the Contractor shall obtain permission and all necessary permits for any work in adjacent properties, easements, and road rights-of-way. All costs associated with obtaining, submitting and maintaining permits, and permitting fees shall be paid for by the Contractor and the costs area incidental to the project.

G. Prior approval shall be obtained from the Owner and Professional before removal of any trees. Trees shall be removed as directed by the Professional. The cost for removal is incidental to the Contract. All trees, vegetation, and brush removed must be transported from the site and disposed of in an approved facility.

H. The Contractor shall be responsible for all sampling and analyses necessary for disposal and/or waste characterization, and backfill verification.

3.02 PROTECTION

A. The Contractor shall supply temporary fencing to enclose the entire work area. Contractor shall ensure the excavations are enclosed inside the fencing at the end of each workday. Excavations should be checked each day for adequacy of protection. Cost of fence and daily placement/removals thereof are incidental to the project.

B. Protect the public utilities and any surface water bodies from hazards related to excavation activities, and implement applicable erosion control measures.

C. The Contractor shall grade the excavation perimeter to prevent surface and storm water runoff entering the excavation.

D. The Contractor is responsible for protecting the sides of open excavations, to prevent collapse, and any settlement of adjacent structures. The method of earth support is the responsibility of the Contractor**.**

E. The Contractor shall perform all excavating in accordance with OSHA regulations, including sloping/shoring. Provide maximum safety to the workers during all site activities.

F. The Contractor shall provide necessary engineering controls to ensure proper support to the excavation walls and to support the excavation while excavating soil near adjacent buildings. If an engineered earth support system is used, the Contractor shall remove the earth support system after the excavation has been backfilled. The cost associated with the support systems shall be incidental to the project.

G. As part of the overall Health and Safety Plan, the Contractor shall continuously monitor air quality at the site perimeter, as necessary.

H. Protect all existing monitoring wells located at the site.

3.03 EXCAVATION AND REMOVAL

A. Excavation work shall be conducted over the entire width of the berm behind the targets and as shown in the Range 5 aerial view and cross-section drawings (Figure 5 and 6) provided in contract documents. Contaminated soil excavation and backfill shall be completed as dig and load.

B. The Contractor shall excavate the soils to an anticipated approximate depth of up to 3 feet from the berm face and upto 5 feet in the areas of bullet pockets, and as directed by the Professional based on visual and field screening of the soil.

C. Contractor’s Competent Person shall ensure that the excavation sidewalls are properly sloped/benched and/or properly protected from cave-in accordance with OSHA and other applicable regulations.

D. Each area of the excavation shall be treated and backfilled immediately upon complete removal of the contaminated soils, in order to prevent cave-ins.

E. The Contractor shall excavate soils in horizontal layers for identification by Professional of contaminated soil to excavate and dispose. The Professional shall monitor the excavation visually, and by using monitoring instrumentation such as a portable X-ray fluorescent (XRF) analyzer. This monitoring will be performed to determine the horizontal and vertical limits of excavation. The excavation extent will be driven by field screening and will continue until Owner determines that excavation is complete. Contractor shall assist the Professional in collecting soil samples as required by the Professional in making this determination.

F. The Contractor shall treat and backfill all excavations after the field screening and approved by the Professional and Owner, and after the collection of post-excavation samples from the bottom of the excavation. Contractor shall assist the Professional in collecting soil samples as required by the Professional. Soil treatment and backfilling shall not commence until approved the Professional and Owner.

G. Any temporary stockpiling of contaminated soils, as approved by the Professional, shall be placed on a plastic liner (30-mil minimum thickness). A one-foot berm shall be built on all sides, prior to placement of the liner. The liner shall have a minimum 3-foot wide soil-free perimeter around the stockpiles. The stockpile shall be completely covered, if left overnight, with plastic liner (6-mil minimum thickness) anchored securely to protect against wind and precipitation, as directed by the Professional. Stockpiles shall be sloped to minimize creeping or sloughing of the soils. Diking or other measures shall be used to prevent surface runoff from flowing onto the liners on which the soil is placed. Where several sheets of plastic are necessary to cover the stockpiles, the edges shall overlap a minimum of 2 feet and taped. Once the stockpile has been covered, the soil-free perimeter of the liner shall be secured with concrete blocks. The Contractor, under the direction of the Professional, shall daily inspect the liners and covers for defects and damage. Should any tears, defects, or other damages be found, the Contractor shall replace or repair the damaged plastic sheets.

H. Excavated soils shall be transported to and treated and disposed of at a Federal and State approved off-site disposal facility. Excavated soils are not allowed to be treated on-site.

3.04 EXAMINATION, TESTING, AND ANALYSIS

A. Verification sampling and analysis of the soils of the excavated sidewalls and bottom is the Professional's responsibility. The Contractor shall aid the Professional in the collection of all necessary excavation samples.

B. Sampling and analysis necessary for waste characterization and proper disposal of the contaminated soils are the Contractor's responsibility. Sampling locations, number, and specific procedures shall be as required by the disposal facility, and local, State, and Federal regulations.

C. Sampling, characterization, transportation, treatment, and disposal of contaminated soils shall be in accordance with all Federal, State, and local solid, non-hazardous, and hazardous

waste laws and regulations, including, but not limited to, the Resource Conservation and Recovery Act (RCRA), and other conditions specified herein.

D. Verification that the backfill material is from virgin source and uncontaminated is the responsibility of the Contractor. The Contractor shall provide the Professional with a certification from the proposed backfill source facility(s) that the backfill material is mined from a virgin source and is free from contamination. In addition, Contractor shall provide analytical results of the backfill sand and top soil prior to mobilization.

3.05 BERM RECONSTRUCTION

A. Prior to backfilling the berm excavations; Professional will collect Verification of Soil Remediation (VSR) samples. Contractor shall assist the Professional as necessary in the collection of samples from the excavation floor and sidewalls, as directed by the Professional. Contractor shall not cease excavation operations or begin backfilling operations until approved by the Owner and Professional.

B. Backfilling

1. The Contractor shall verify that all backfill material to be used is approved by the Owner prior to beginning work.
2. Backfilling shall not begin until contaminated soils are removed as approved by the Professional; and excavations are cleaned of trash and debris.
3. The Contractor shall treat the berm excavation area with the lime and/or other approved additive immediately prior to placement of backfill sand.
4. Berm face shall be reconstructed using modified MDOT Class II sand with 100% of the sand passing though #4 sieve shall be placed in horizontal lifts not exceeding 12 inches in loose thickness, or 6 inches when hand-operated compactors are used. Do not compact up the slope of the berm face. Utilize benching and keying techniques to enhance the slope stability. Contractor shall utilize compaction methods and techniques such that the integrity of the berm shall not be impacted. Contractor shall be responsible for any necessary testing to ensure the berm stability.

C. The Contractor shall restore all ground areas disturbed as a result of the work, access, staging, stockpiling, excavation, and removal activities using satisfactory material.

3.06 DISPOSAL

The materials required to be removed and disposed of and all waste, excess, and unsatisfactory materials resulting from Work required under this Section shall be removed from the site, unless otherwise specified or directed. All disposal activities shall conform to local, State, and Federal regulatory requirements.

3.07 PROJECT DOCUMENTATION

The Contractor shall submit to the Professional, within 14 days of completing Work, a copy of the following project documentation:

A. Copies of all testing/analyses performed.

B. Appropriate certification of final disposal documentation signed by the responsible disposal facility official.

3.08 QUALITY CONTROL

The Contractor shall establish and maintain a quality control system for all operations performed under this Section, to assure compliance with contract requirements, and maintain records of its quality control for all operations performed, including, but not limited to, the following:

A. Observance of safety regulations

B. Quality of materials

C. Protection, maintenance, and repair

END OF SECTION

SECTION 02 81 00

OFFSITE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.01 WORK INCLUDED

A. Ensure that all vehicles entering and leaving the site comply with all safety requirements and licensing requirements of the Federal, State, and local regulations.

B. Prepare vehicles to prevent spillage, leakage or contamination.

C. Inspect vehicles before leaving the site.

D. Transport equipment to and from the site.

E. Transportation and disposal of hazardous and non-hazardous material, soils, debris and waste generated from work activities in accordance with all local, State, and Federal solid and hazardous waste laws and regulations, and conditions specified herein.

F. Transportation, treatment, and disposal of RCRA characteristic hazardous soils from the berm with contaminant levels exceeding 10 x universal treatment standards (UTS), at an approved RCRA TSD facility in accordance with Federal and State laws and regulations.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1910	Occupational Safety and Health Standards
29 CFR Part 1926	Safety and Health Regulations for Construction
40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

49 CFR Part 171	Department of Transportation Regulations to Stipulate Requirements for Containers and Procedures for Shipment of Hazardous Waste
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR Part 173	Shippers General Requirements for Shipment and Packaging
49 CFR Part 177	Carriage by Public Highway
49 CFR Part 180	Rules for Continuing Qualifications and Maintenance of Packaging

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30	(1990) Flammable and Combustible Liquids Code
NFPA 70 B	(1990) Recommended Practice for Electrical Equipment Maintenance
NFPA 325M	Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids

STATE OF MICHIGAN

PA 451, PART 201	Michigan Natural Resources and Environmental Protection Act
PA 451, PART 211	Underground Storage Tanks
PA 451, PART 213	Leaking Underground Storage Tanks
PA 451, PART 111	Michigan, NREPA Hazardous Waste Management Act
PA 451, PART 115	Michigan, NREPA Solid Waste Management Act
PA 136	Michigan Liquid Industrial Waste Act

1.03 PERMITS, LICENSES, AND CERTIFICATIONS

The Contractor shall obtain all applicable permits, waste approvals, and State licenses required for transportation and disposal of any debris or waste resulting from the Work.

1.04 SUBMITTALS

A. The Contractor shall submit the names of the disposal facilities and verification that each facility is properly licensed by State and Federal agencies to accept the types and quantities

of intended materials or waste. This information shall be submitted to the Professional for approval, as specified in Section 01300-Submittals.

B. Before disposal operations begin, the Contractor shall submit the transportation routes to the selected solid and liquid disposal facilities to the Professional for approval. The Contractor shall use designated truck routes and shall comply with all seasonal load restrictions.

C. The Contractor shall submit a Spill Contingency Plan for transportation of solids and liquid to the Professional for approval before disposal operations begin. This plan shall address all the potential hazards, necessary actions to follow in case of spills, and emergency phone numbers enroute to each disposal facility.

D. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as directed by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts and manifests to the Professional at the end of each day that material is shipped offsite and upon request.

E. The Contractor shall submit copies of all manifests and bills of lading to the Professional during transportation and disposal operations.

F. The Contractor shall submit a Decontamination Plan that includes vehicle decontamination and prevention of mud-tracking offsite.

G. All cost for submittals are incidental to the project.

1.04 PROJECT RECORD DOCUMENTATION

A. Contractor shall prepare waste transportation and disposal manifests and all other documents required for waste shipment and disposal for each load of waste materials being transported and disposed in accordance with the State and Federal regulations. The Contractor is responsible for obtaining the Professional, Owner, or Owner-authorized representative's signature on manifests for transportation and disposal purposes. Contractor shall be responsible for any fee required by EGLE and/or EPA for manifests or e-manifests.

B. Contractor shall verify and record weight, volume, and character of material disposed. The Contractor shall provide documentation that the measuring devices used are certified by the appropriate State inspection agency.

C. The Contractor shall provide to the Professional written documentation and records verifying receipt and the quantity received of each load at the disposal facility and verification of proper disposal. Copies of the actual receipt must be provided.

D. The hazardous waste manifests and forms shall be consistent with the State of Michigan, US EPA, and U.S. Department of Transportation requirements.

E. All of the materials shall be sampled and analyzed in accordance with the requirements as required by the appropriate treatment/disposal facility, and by applicable regulations.

PART 2 PRODUCTS

2.01 EQUIPMENT

The Contractor shall provide equipment, personnel, and facilities necessary to handle, load, and effectively manage materials for transport to off-site disposal/recycling facilities.

PART 3 EXECUTION

3.01 LOADING AND HAULING

A. All haul vehicles are to be inspected by the Contractor for soil adhesion to wheels, under carriage, and other external components. These soils shall be removed and properly handled by the Contractor before the haul vehicle leaves the site. The decontamination procedures shall be carried out in the decontamination zone. Before leaving the site, all vehicles shall be approved by the Professional. All rinse waters are to be collected for temporary storage prior to disposal. The Contractor will sample collected rinse waters to ensure proper disposal. Contractor shall be responsible for the disposal and any associated testing. All associated decontamination costs are incidental to the project.

B. Transport vehicles shall not be allowed to leave the site if they are leaking or spilling materials or there is evidence that leaking or spilling may likely occur.

C. All transport vehicles shall be in strict conformance with all the applicable Federal, State, and local laws.

D. The Contractor shall keep accurate records for the following information: Type and quantity of materials, including liquids, removed from the site and analytical testing results. Professional approval is required before any liquid or material leaves the site.

E. The Contractor shall provide the Professional with copies of the aforementioned records, all permits required, manifests, waste hauling permits, and necessary affidavit regarding the waste materials, including liquid disposal.

F. All transport vehicles shall be cleaned before loading with waste material.

G. Prior to transportation, all of the established pre-transportation requirements shall be met.

H. The waste shall be transported by an appropriately certified waste hauler in approved labeled containers.

I. No activities, including loading, shall occur in areas that will obstruct the view of traffic.

J. The Contractor shall clean the ingress/egress routes as needed, and all waste loading and hauling shall be conducted in accordance with MDOT and local standards and regulations.

3.02 DISPOSAL

A. All disposal activities shall conform to Federal, State, and local government regulations.

B. For contaminated wastes, the Contractor shall use a State of Michigan-approved manifest system or the manifest system approved by the State where the receiving facility is located, so that the waste can be tracked from generation to ultimate disposal. The manifest shall comply with all of the provisions of the transportation and disposal regulations. All transporters must sign the appropriate portions of the manifest and must comply with all of the provisions established in the applicable regulations. Waste manifests must be signed by the Professional, Owner, or Owner-authorized representative.

C. The waste manifest shall comply with all of the provisions of the transportation and disposal regulations. All transporters and disposal facility must sign the appropriate portions of the manifest and must comply with all of the provisions established in the applicable regulations.

D. Contaminated soils shall be treated and disposed of at a Professional or Owner pre-approved licensed RCRA TSD facility.

E. All arrangements and scheduling with the disposal facility shall be performed by the Contractor. The Contractor is also responsible for all waste characterization sampling and analysis required for disposal. The Contractor is also responsible for obtaining necessary approvals from the treatment/disposal facilities.

3.03 SPILLS

The Contractor is responsible for cleaning up all leaks and spills that occur from containers and other items onsite or offsite. Immediate containment actions shall be taken, as necessary, to minimize the effect of any spill or leak. The Contractor shall notify the Professional and appropriate governmental authorities of the incident. Cleanup shall be in accordance with applicable Federal, State, and local laws and regulations at no additional cost to the Owner.

END OF SECTION

SECTION 02 92 00

SITE RESTORATION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Compact the backfilled berm surface and finish the berm surface with placement of 4-inch thick top soil, seed and installing appropriate permanent erosion control measures.

B. All impacted areas by site activities, including pavements, roads, vegetation, monitoring wells, and all other disturbed or altered structures/features shall be restored to pre-work condition.

1.02 REFERENCES

A. Federal Interagency Stream Restoration Working Group, Stream Corridor Restoration Principles, Process, and Practices, GPO No. 0120-A, Rev. 2000

B. Michigan Department of Environmental Quality, Guidebook of Best Management Practices for Michigan Watersheds

C. U.S. Army Corps of Engineers (USACE), Hydraulic Design of Flood Control Channels (EM-1110-2-1601), 1991

D. U.S. Department of Defense (USDOD), Unified Facilities Criteria (UFC) Small Arms Ranges UFC 4-179-02, March 2025

1.03 SUBMITTALS

A. The Contractor shall fully describe the means, procedures, and materials to be used to restore the site to its pre-existing condition in the Project Work Plan, in accordance with Section 01300-Submittals.

B. The Contractor shall provide the following restoration materials data to the Professional. The Professional must approve the materials before the materials are delivered to the site.

1. Fill Sand: See Section 026100.

2. Topsoil: See Section 026100.

3. Construction materials for monitoring wells, if necessary, to verify that monitoring wells are repaired and/or replaced to original construction and condition.

C. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as directed by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts/delivery tickets to the Professional at the end of each day that material is shipped to the site and upon request.

PART 2 PRODUCTS

2.01 MATERIALS

A. Clean Fill: Virgin fill must be used, and the source of the fill must be identified, reviewed and approved by the Professional/ Owner prior to work starting. Clean fill shall meet MDOT Class II gradation modified for 100% to pass through #4 sieve.

B. Top Soil: Topsoil shall be sourced from a commercial topsoil provider. Documentation from the provider with information on the location the topsoil will be mined from, and a statement that it is virgin material must be provided, reviewed and approved by the Owner prior to being placed at the site. Contractor shall provide screened top soil sample to the Profession for visual inspection and approval prior to the transport to the site, if requested. Top soil shall be screened, free of stones, stumps, lumps and similar objects larger than 2-inches in diameter, and shall, at a minimum, meet the following requirements:

1. Must be screened.

2. Must be free of` contaminants.

3. Must not be excessively acidic or excessively alkaline.

4. Must not contain natural underlying soils, subbase materials, or other unsuitable material.

5. Must consist of natural loam or sandy loam soils adapted to sustain plant life.

C. Seed Composition: The seed mix shall be low maintenance fescue. Contractor shall obtain Owner’s approval of the proposed seed mix prior to seeding.

D. Mulch: All temporary and permanent erosion controls measures shall be applied in accordance with the SESC permit.

PART 3 EXECUTION

3.01 TIME OF RESTORATION

No restoration shall be performed in any area of the site until the Professional determines that site activities in that area are complete.

3.02 SURFACE GRADE

A. After excavation and backfilling activities have been completed, all disturbed surfaces shall be rough graded, prior to surface restoration, so as to leave no ruts, pits, piles, or ridges. If fill is required, the Contractor shall be responsible for settlement of fill over any fill areas and shall be required to repair any voids or holes that appear for a period of one year after final acceptance of work by the Professional, at the Contractor's own expense. The cost for fill for surface grading is incidental to the project. The top of the fill shall be 4 inches below the final grade to accommodate top soil.

B. Contractor shall place 4 inches of screened top soil throughout the disturbed areas (other than the gravel area), seed a sunny grass mix approved by the Professional, fertilize, and mulch. The top soil shall be screened and free of stones, stumps, lumps and similar objects larger than 2-inches in diameter, and shall be raked out. The Contractor shall apply starter type fertilizer at the rate recommended by the manufacturer. The Contractor shall be required to place top soil and seed as required, and provide any maintenance for a complete establishment of grass cover within one year of final acceptance, at Contractor's own expense.

3.03 FINISH GRADE

A. The finished grade of the berm face shall match the preexisting grade, as required by the US DOD's Unified Facilities Criteria and as directed by the Owner/Professional.

B. Finish all surface grade to match the pre-work grade at all other areas of the site. Grading shall be conducted as directed by the Owner/Professional.

C. All impacted area by site activities, including pavements, roads, vegetation, and all other disturbed or altered structures/features shall be restored to pre-work condition.

3.04 ROADWAY AND PARKING AREAS

Contractor is required to clean and repair, in-kind or better, any areas of the Contractor's access roads, any parking areas, or other roadways/sidewalks/areas disturbed as a result of the Contractor's work or access, at no additional cost to the Owner.

3.05 MONITORING WELLS

Contractor is required to repair, to original condition, any monitoring wells damaged or removed outside the excavation as a result of Contractor's work, at no additional cost to the Owner.

3.06 SITE CLEANING AND DISPOSAL

See Section 01740-Cleaning

3.07 ACCEPTANCE

Landscape Work will be considered acceptable when a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 square feet and bare spots not exceeding 5 inches by 5 inches.

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Clearing and grubbing shall be performed, as necessary, to provide access to perform the berm excavation work on the project site as approved by the Owner.

1.02 DEFINITIONS

A. Clearing

Clearing is defined as the removal of trees, brush, shrubs, down timber, rotten wood, rubbish, any other vegetation and objectionable material at or above original ground elevation not designated to be saved. Clearing also includes removal of fences, walls, guard posts, guide rails, signs, debris, and other obstructions that obtrude, encroach upon or otherwise interfere with the proposed Work.

B. Grubbing

Grubbing is defined as the removal of stumps, roots and stubs, brush, organic materials and debris from below the ground surface.

1.03 PROJECT/SITE CONDITIONS

The Contractor shall clear all obstructions within the excavation limits of Work and to access the work area as approved by Owner or Professional. All removed trees, cleared brush, stumps, and vegetative debris shall become the property of the Contractor.

1.04 SUBMITTALS

Contractor shall submit a letter of acceptance from the proposed disposal facilities and provide certificates of disposal.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION

A. Notify the Professional at least 24 hours prior to beginning any clearing or grubbing work.

B. Protect permanent/temporary benchmarks, monitoring wells, signs, and utilities, and other structures.

C. Contractor shall notify the Professional, at least 72 hours in advance of the clearing/grubbing operations, so that a record can be made of the type or kind of trees and their condition.

D. Where it is necessary to cut branches of trees that are not to be removed, the cut shall be made flush with the tree trunk or larger branch, care being used to prevent tearing the bark beyond the cut, and the cuts shall be painted with acceptable commercial tree wound dressing.

3.02 UTILITIES

A. Inform all companies, individuals, and other entities owning or controlling facilities or structures within the limits of the Work which have to be relocated, adjusted, or reconstructed in sufficient time for the utility to organize and perform such Work in conjunction with or in advance of the Contractor's operations.

B. Comply with the provisions of Michigan Public Act (PA) 53 of 1974 "Protection of Underground Facilities

3.03 CLEARING

A. Clearing shall be performed as necessary to facilitate the completion of the Work and as otherwise directed by the Professional.

B. Fell trees in a manner that will avoid damage to trees, shrubs, and other installations which are to be retained. The Contractor shall replace trees and shrubs intended to remain that are damaged beyond repair or removed.

C. Remove guard posts, guide rails, signs, and other interferences as necessary for performance of the Work. Protect and store the materials in secure locations approved by the Owner or the Professional, and replace when work is complete.

3.04 GRUBBING

A. Grub areas within the excavation limits to remove roots and other objectionable material to a minimum depth of 12 inches.

B. Remove all stumps within the cleared areas unless otherwise authorized by the Professional.

3.05 DISPOSAL

A. Trees, cleared brush, stumps, and vegetative debris shall become the property of the Contractor and properly disposed at a preapproved location, unless otherwise approved by

the Owner and/or the Professional. Contractor shall dispose the material in compliance with applicable Federal, State and local regulations.

B. Burning of trees, logs, branches, brush, stumps, and debris is prohibited.

3.06 RESTORATION

A. Replace all facilities removed/disturbed during the work.

END OF SECTION

DIVISION 32

EXTERIOR IMPROVEMENTS

SECTION 32 92 00

TURF AND GRASSES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Seeding of low maintenance fescue.

1.02 DEFINITIONS

A. Pesticide
A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

B. Planting Soil
See sections 02 92 00 Site Restoration.

1.03 SUBMITTALS

A. Certification of grass seed.
B. Product certificates.
C. Pesticide applicator license.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Contractor shall provide a qualified landscape installer whose work has resulted in successful plant establishment.
   1. Installer's Field Supervision: Contractor shall maintain an experienced full-time supervisor on the Project site when work is in progress.

B. Pesticide Applicator: Pesticides shall be applied by a Commercial Pesticide Applicator certified by the Michigan Department of Agriculture and Rural Development.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials
Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

PART 2 PRODUCTS

2.01 SEED

A. Seed: Fresh, clean, dry, new-crop seed in 50-lb bags.
B. Seed Species: low maintenance fescue.

2.02 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorus, and potassium as approved by the Owner.

2.03 MULCHES

A. Contractor shall install net backing mulch blankets on the berm slopes and as approved by the SESC plan and approved permit. Straw mulch other areas with slopes not exceeding 1:6.

2.04 PESTICIDES

A. The Contactor shall only use pesticides approved by the Owner.

PART 3 EXECUTION

3.01 PREPARATION

A. Disc or till soil existing soil prior to planting.

3.02 SEEDING

A. Sow seed with broadcast spreader. Do not broadcast when wind velocity exceeds 5 mph.
   1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other
   2. Do not use wet seed or seed that is moldy or otherwise damaged.
   3. Drill seed in slopes exceeding 1:6.

B. Sow seed at a total rate of 100 pounds per acre.

C. Cultipack

D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly to form a continuous blanket.

E. Install mulch blankets on slopes exceeding 1:6. Overlap and properly anchor blankets with staples/stakes.

3.05 SATISFACTORY PLANTING

A. Low maintenance fescue installation shall meet the following criteria as determined by the OWNER:

1. A healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding (90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches)

B. Use specified materials to reestablish grass that does not comply with requirements, and continue maintenance until turf is satisfactory.

END OF SECTION

TABLES

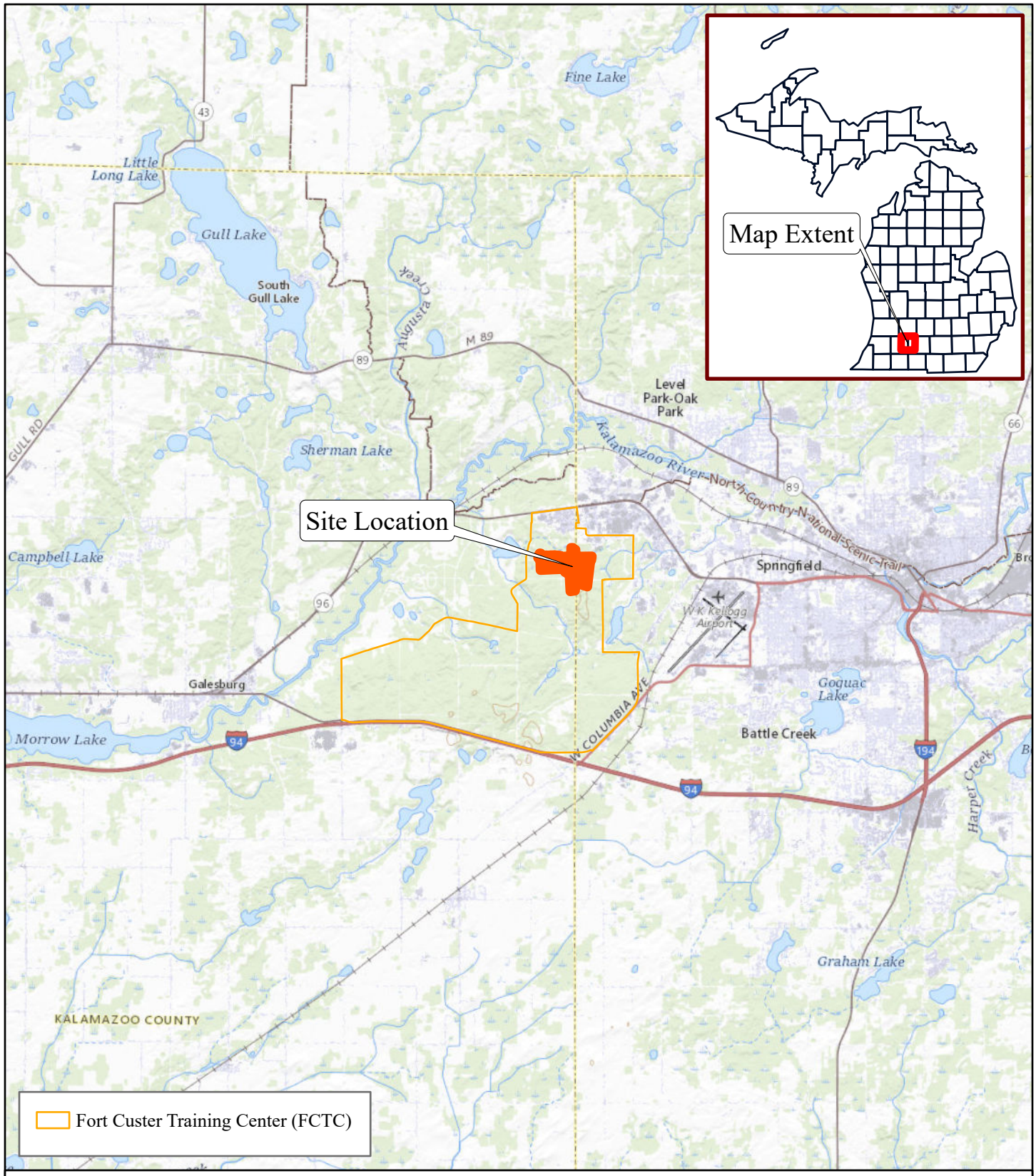
Table 1

Berm Soil Sample Sieving & Analytical Results Summary

Fort Custer Training Center

		Sieve Analysis										Analytical Results			
Berm # (Sample Interval)	**Soil Collected from Berm (grams)**	**Soil Used for Sieve Analysis (grams)**	**Sieve #**	**Sieve Size Opening Diameter (inches)**	**Material Retained (grams)**	**Material Retained % weight**	**Cumulative Material Retained % weight**	**Bullets Retained (grams)**	**Bullets Retained % weight**	**Pebbles and Soil Retained (grams)**	**Pebbles and Soil Retained % weight**	**Lead Total (mg/kg)**	**Lead TCLP (mg/L)**	**Copper Total (mg/kg)**	**Copper TCLP (mg/L)**
Berm 2 (0-1.5')	3,461	3,000		3/8	254	8.5%	8.5%	12.4	4.9%	241	95%	5,800	120	560	12
				1/4	183	6.1%	14.5%	18.3	10.0%	164	90%				
			6	1/8	290	9.7%	24.2%	16.5	5.7%	274	94%				
			pan	0	2,260	75.3%	99.5%	0	0.0%	2,260	100%				
								47.2	1.6%						
Berm 2 (1.5-3')	4,125	3,000		3/8	256	8.5%	8.5%	8.2	3.2%	248	97%	2,500	50	580	13
				1/4	199	6.6%	15.2%	18.3	9.2%	180	91%				
			6	1/8	305	10.2%	25.3%	1.2	0.4%	304	100%				
			pan	0	2,239	74.6%	100.0%	0	0.0%	2,239	100%				
								27.7	0.9%						
Berm 3 (0-1.5')	3,576	3,000		3/8	180	6.0%	6.0%	11.2	6.2%	169	94%	4,400	140	370	23
				1/4	180	6.0%	12.0%	11.8	6.6%	168	93%				
			6	1/8	359	12.0%	24.0%	5.3	1.5%	353	99%				
			pan	0	2,291	76.4%	100.3%	0	0.0%	2,291	100%				
								28.3	0.9%						
Berm 3 (1.5-3')	2,889	2,889		3/8	223	7.7%	7.7%	20.6	9.2%	202	91%	2,400	54	120	4.5
				1/4	164	5.7%	13.4%	2.9	1.8%	161	98%				
			6	1/8	407	14.1%	27.5%	3	0.7%	404	99%				
			pan	0	2,096	72.5%	100.0%	0	0.0%	2,096	100%				
								26.5	0.9%						
Berm 4 (0-1.5')	3,802	3,000		3/8	102	3.4%	3.4%	16.5	16.2%	85	84%	4,100	130	350	9.2
				1/4	93	3.1%	6.5%	10.6	11.4%	82	89%				
			6	1/8	245	8.2%	14.6%	5.3	2.2%	239	98%				
			pan	0	2,567	85.6%	100.2%	0	0.0%	2,567	100%				
								32.4	1.1%						
Berm 4 (1.5-3')	3,891	3,000		3/8	143	4.8%	4.8%	0	0.0%	143	100%	1,500	43	77	< 1
				1/4	141	4.7%	9.5%	0	0.0%	141	100%				
			6	1/8	326	10.9%	20.3%	0	0.0%	326	100%				
			pan	0	2,406	80.2%	100.5%	0	0.0%	2,406	100%				
								0	0.0%						
Berm 5 (0-1.5')	3,551	3,000		3/8	115	3.8%	3.8%	1.2	1.0%	113	99%	3,100	140	190	9.8
				1/4	183	6.1%	9.9%	0.6	0.3%	183	100%				
			6	1/8	371	12.4%	22.3%	3	0.8%	368	99%				
			pan	0	2,332	77.7%	100.0%	0	0.0%	2,332	100%				
								4.8	0.2%						
Berm 5 (1.5-3')	3,403	3,000		3/8	188	6.3%	6.3%	8.8	4.7%	179	95%	1,700	200	150	26
				1/4	170	5.7%	11.9%	1.7	1.0%	168	99%				
			6	1/8	408	13.6%	25.5%	1.2	0.3%	407	100%				
			pan	0	2,246	74.9%	100.4%	0	0.0%	2,246	100%				
								11.7	0.4%						
Berm 6 (0-1.5')	4,099	3,000		3/8	157	5.2%	5.2%	13.5	8.6%	143	91%	12,000	500	850	31
				1/4	127	4.2%	9.4%	21.8	17.2%	105	83%				
			6	1/8	276	9.2%	18.6%	8.2	3.0%	268	97%				
			pan	0	2,456	81.9%	100.5%	0	0.0%	2,456	100%				
								43.5	1.5%						
Berm 6 (1.5-3')	3,747	3,000		3/8	197	6.6%	6.6%	15.3	7.8%	182	92%	6,000	300	410	15
				1/4	190	6.3%	12.9%	20	10.5%	170	89%				
			6	1/8	353	11.8%	24.7%	11.8	3.3%	341	97%				
			pan	0	2,275	75.8%	100.5%	0	0.0%	2,275	100%				
								47.1	1.6%						
							Bullets Retained on Sieves - Average of all Berms:	26.9	0.9%						

FIGURES



N
W E S

0 1 2 Miles

1 inch = 2 miles

Figure: 1
Site Location
Fort Custer Training Center

2501 26th St
Augusta, MI 49012
Michigan Department of Military and Veterans Affairs

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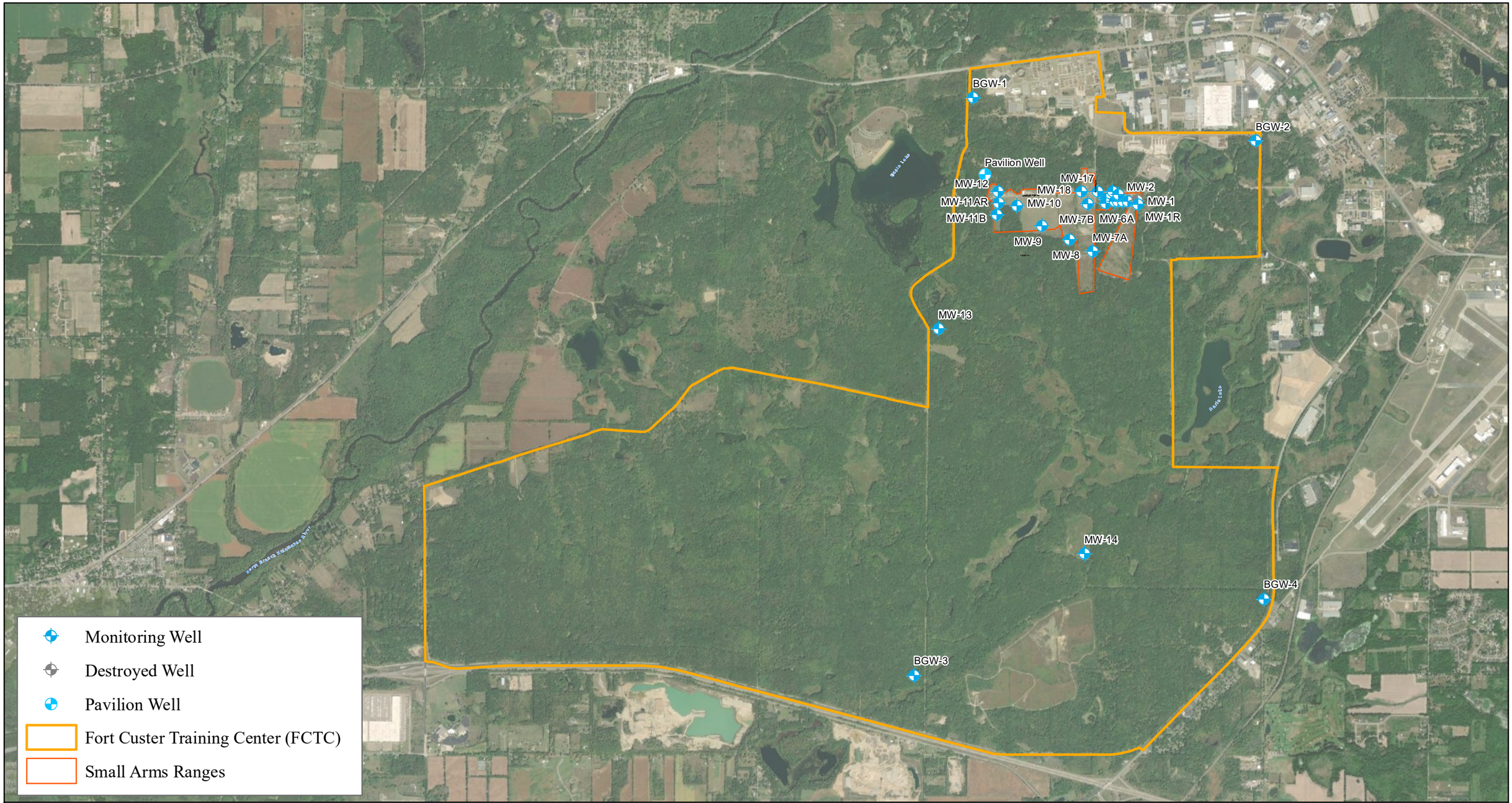
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

Data Sources: State of Michigan, FCTC

1941-6940-21 Author: AG Date: 7/14/2022

Document Path: C:\Users\agonguela\OneDrive - DLZ\Documents\ArcGIS\Projects\FCTC Berm FS Figures\mxd-aprx\07-13-2022\Fig_01_Site_Location_aprx



Document Path: C:\Users\agonguela\OneDrive - DLZ\Documents\ArcGIS\Projects\FCTC Berm FS Figures\mxd-aprx\07-13-2022\Fig_02_Site_Map.mxd

N
W E
S

0 1,500 3,000
1 inch = 3,000 feet

Figure: 2
Site Map
Fort Custer Training Center
2501 26th St
Augusta, MI 49012
Michigan Department of Military and Veterans Affairs

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Fig: 2

Data Sources: State of Michigan, FCTC

1941-6940-21 Author: AG Date: 7/13/2022

Document Path: C:\Users\agonguela\OneDrive - DLZ\Documents\ArcGIS\Projects\FCTC Berm FS Figures\mxd-aprx\07-13-2022\Fig_03_Small_Arms_Ranges.mxd

N
W E
S

0 325 650
1 inch = 650 feet

Figure: 3
Small Arms Ranges
Fort Custer Training Center
2501 26th St
Augusta, MI 49012
Michigan Department of Military and Veterans Affairs

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Fig: 3

Data Sources: State of Michigan, FCTC

1941-6940-21 Author: AG Date: 7/13/2022

Armstrong Rd

MW-17

MW-16

Mathieu/Range Rd

MW-15

MW-6B

R6

R5

R4

R3

R2

MW-5

MW-4

MW-3

MW-2

MW-6A

Monitoring Well

N

W

E

S

0 40 80

1 inch = 80 feet

Figure: 4
Small Arms Ranges - 2,3,4,5 and 6
Fort Custer Training Center
2501 26th St
Augusta, MI 49012
Michigan Department of Military and Veterans Affairs

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Fig: 4

Data Sources: State of Michigan, FCTC

1941-6940-21 Author: AG Date: 8/2/2022

Document Path: C:\Users\agonguela\OneDrive - DLZ\Documents\ArcGIS\Projects\FCTC_Berm FS Figures\mxd-aprx\07-13-2022\Fig_04_Small_Arms_Ranges2_3_4_5_6.mxd

FIGURE 5
RANGE 5 AERIAL VIEW

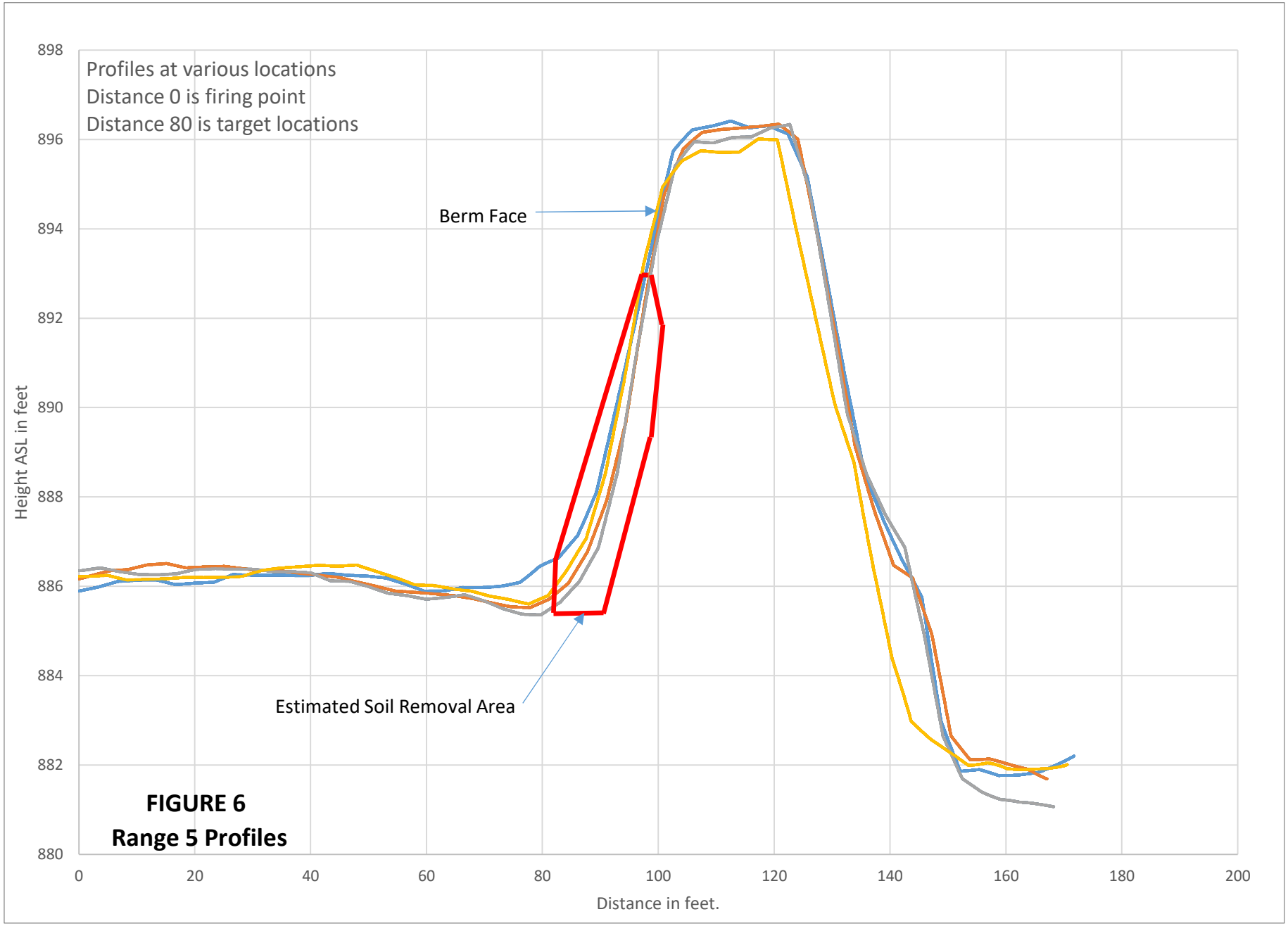


FIGURE 6
Range 5 Profiles

APPENDIX I

GLOSSARY

GLOSSARY

Activity– An element in the Progress Schedule establishing a requisite step, or the time and resources required, for completing the part of the Work associated with that Activity.

Addenda– Written instruments that are used by the Owner and/or Professional to incorporate interpretations or clarifications, modifications, and other information into the Bidding Documents. An Addendum issued after Bid opening to those Bidders who submitted a Bid, for the purpose of re-bidding the Work without re-advertising, is referred to as a **post-Bid** Addendum.

Agency- Any unit, section, division, department, or other instrumentality of the State that benefits from the Work.

Alternate– Refers to work specified in the Bidding Documents for which the Bidder must bid a Bid Price.

Apparent Low Bidders: Those Bidders whose Base Bid, when added to those specific Alternates the Owner intends to accept, yields the three lowest sums of Bid and Alternates. Additional Bidders may be considered Apparent Low Bidders if their Bid, when added to those specific Alternates the Owner intends to accept, yields a sum within 10% of the lowest of the Apparent Low Bidder's sum. If a qualified disabled veteran meets the requirements of the contract solicitation, provides acceptable responses to both Part One and Part Two of the Best Value Construction Bidder Evaluation to achieve a Best Value recommendation and with the veteran's preference is the lowest responsive, responsible, best value Bidder it is considered the Apparent Low Bidder.

Archaeological Feature– Any prehistoric or historic deposit of archaeological value, as determined by a representative of a State Agency that is duly authorized to evaluate such findings and render such judgments. An Archaeological Feature deposit may include, but is not limited to Indian habitations, ceremonial sites, abandoned settlements, treasure trove, artifacts, or other objects with intrinsic archaeological value and that relate to the history and culture of the State of Michigan.

Authorized Technical Data– Information and data contained in a report of exploration and tests of subsurface conditions. Also, any physical data (dimension, location, conditions, etc.) contained in those Drawings of physical conditions of existing surface and subsurface facilities.

Best Value- The bids will be evaluated for best value based on price and qualitative components that may include but are not limited to technical design, technical approach, quality of proposed personnel, and management plans, per PA 430 of 2012.

Bid– Written offer by a Bidder for the Work, as specified, which designates the Bidder's Base Bid and Bid Prices for all Alternates. The term *Bid* includes a *re-bid*.

Bidder– The Person acting directly, or through an authorized representative, who submits a Bid directly to the **Owner**.

Bidding Documents– The proposed Contract Documents as advertised, and all Addenda issued before execution of the Contract.

Bid Price– The Bidder's price for a lump sum item of work, or the product of the Bidder's unit price for an item of Unit Price Work times the quantity given on the Bid Form for that item.

Bid Security– A security serving as a guarantee that the Bidder will conform to all conditions.

Bidding Requirements–The Advertisement, Instructions to Bidders, Supplementary Instructions, Information for Bidders, Bid Form, Bid Form Attachments, and qualification submittals, as advertised and as modified by Addenda, and any other Section included within Division 0 of the Bidding Documents for the purpose of governing bidding and award of the Contract.

Board– The Administrative Board of the State of Michigan.

Bond– Security furnished by the **Contractor**, as required by the Contract Documents.

Business Day– Any Day except Saturdays, Sundays and holidays observed by the **Owner.**

Bulletin– A request used by the **Owner** to describe a change in the Work under consideration by the **Owner** and to request the **Contractor** to submit a proposal for the corresponding adjustment in Contract Price and/or Contract Time, if any.

Calendar Day– Every day shown on the calendar, Saturdays, Sundays, and holidays included.

Cash Allowance– An **Owner**-specified sum included within the Contract Price to reimburse the **Contractor** for the actual purchase/furnished cost of materials and/or equipment or other designated items, as specifically provided in the Contract Documents. Although the scope (e.g., the required quantity) of any Work covered by a Cash Allowance is sufficiently detailed in the Contract Documents for the purposes of bidding the required labor costs, Subcontract costs, construction equipment costs and general conditions costs and Fee, it is understood that the required materials, equipment or other designated items are of uncertain purchase cost at the time of Bid or are yet to be specified in more detail by the **Professional** as to quality, appearance, durability, finish and such other necessary features affecting purchase price.

Change Order– A written order issued and signed by the **Owner**, which amends the Contract Documents for changes in the Work or an adjustment in Contract Price and/or Contract Time, or both.

Construction Mechanic– A skilled or unskilled mechanic, laborer, worker, helper, assistant, or apprentice working on a state project but shall not include executive, administrative, professional, office, or custodial employees.

Contract Award– The official action of the **Board**, the **Director-SFA** or the **Director-DCD** awarding the Contract to the **Contractor**.

Contract Documents– Written and graphic documents that form the legal agreement between the **Owner** and the **Contractor**, consisting of this document, completed Bid and Contract forms, terms and conditions of the contract, specifications, drawings, addenda, Notice of Award, Notice-to-Proceed and contract change orders.

Contract Price– The total compensation, including authorized adjustments, payable by the **Owner** to the **Contractor** (subject to provisions for Unit Price Work).

Contract Times–The Contract Times for the entire Work are the periods allowed, including authorized adjustments, for Substantial Completion and final completion of the Work. The Contract Times for a designated portion of the Work are the periods allowed for Substantial Completion and final completion of any such portion of the Work, as specified in the Contract Documents.

Contractor– Business enterprise with which the **Owner** has entered into the Contract.

Correction Period– A period during which the **Contractor** must, in accordance with the Contract Documents, (a) correct or, if rejected, remove, and replace Defective Work, and (b) maintain warranties for materials and equipment in full force and effect.

Cost of the Work Involved– The sum of all costs that would be, or were, necessarily incurred by the **Contractor** in providing any Work Involved with the related change, less the costs that would be, or would have been, incurred by the **Contractor** to provide such Work without the related **change**.

Defective– As determined by the Professional, an adjective which when referring to or when applied to the term "Work" refers to (a) Work not conforming to the Contract Documents or not meeting the requirements of an inspection, test, or approval, or (b) Work itemized in a Punch List which the **Contractor** fails to complete or correct within a reasonable time after issuance of the Punch List by the **Professional**.

Delay– Any act or omission or other event that in any manner adversely affects or alters the schedule, progress or completion of all or any part of the Work. Delay is a generic term intended to include deferral, stoppage, slow down, interruption and extended performance, and all related hindrance, rescheduling, disruption, interference, inefficiency and productivity and production losses.

Department (DTMB)– Department of Technology, Management and Budget of the State of Michigan.

Director- The Director of the **Department.**

Director-SFA- The Director of **DTMB** State Facilities Administration.

Director-DCD- The Director of **DTMB** State Facilities Administration, Design and Construction Division.

Division– Each of the numbered, distinct parts (starting with Division 0) into which the Specifications are divided.

Drawings– Part of the Contract Documents showing the Work. Drawings must neither serve nor be used as Shop Drawings.

Emergency– A condition affecting the safety or protection of persons, or the Work, or property at or adjacent to the site.

State Facilities Administration (SFA)-Entity in the **Department** responsible for design, construction, and operations and maintenance of facilities.

Fee for the Work Involved (Fee)– An established, percentage mark-up on the Cost of the Work Involved which is allowed to the **Contractor** for (a) reasonable administrative costs, and (b) negotiated, reasonable profit on the Cost of the Work Involved.

Hazardous Material– Asbestos containing materials (ACMs), Polychlorinated biphenyls (PCBs), petroleum products, such construction materials as paint thinners, solvents, gasoline, oil, etc., and any other like material the manufacture, use, treatment, storage, transportation, or disposal of which is regulated by federal, state, or local Laws governing the protection of public health, natural resources, or the environment.

Invitation To Bid (ITB) - The solicitation document presenting the terms and conditions that will become part of the Contract when the Bid is accepted.

Law(s)– Means federal, state, and local statutes, ordinances, orders, rules and/or regulations.

MCL– The Michigan Compiled Laws of the State of Michigan.

Means and Methods– Includes means, methods, techniques, sequences and/or procedures applicable to the Work.

Notice of Award– Written notice accepting the Bid to the lowest responsive, responsible Bidder and designating the Contract Price (and establishing the Alternates accepted by the **Owner**).

Notice-to-Proceed– Written notice issued by the Project Director directing the Contractor to commence the construction activities and establishing the start date of the Contract Time.

On-Site Inspection– The **Professional's** on-site examination of the **Contractor's** completed or in progress Work to determine and verify to the Project Director that the quantity and quality of all Work complies with the requirements of the Contract Documents.

Owner– The State of Michigan, with whom the **Contractor** has entered into the Contract and for whom the Work is to be provided.

Owner Field Representative– A State employee or consultant, acting collaboratively with the Project Director, providing on-site, periodic observation and documentation of the Work for compliance with the Contract Documents.

Partial Use– The use, by the **Owner,** of a designated portion of the Work before accomplishing Substantial Completion of the entire Work. Partial Use does not mean Substantial Completion of the portion of the Work placed in use by the **Owner**.

Person–Individuals, partnerships, corporations, receivers, trustees, joint ventures or any other legal entity and any combinations of any of them.

Political Subdivision– Any county, city, village, or other local unit of the State, including any agency, department, or instrumentality of any such county, city, village, or other local unit.

Post–Bid Submittal– A Qualification Submittal required of the Bidder selected under Section 00100 - 22 before Contract Award, and which is used by the Owner in the evaluation of the Bid of the selected Bidder.

Professional Services Contractor *(PSC or* ***Professional****)*– The individual or business entity who has the authority to practice the design disciplines required by the Contract Documents. An Agency with appropriate licensing may replace the PSC in their role if a consultant is not used.

Project– The total construction, which includes the Work and possibly other work completed by others, as indicated in the Contract Documents.

Project Director- D*esignated State employee(s) (a) Responsible for directing and supervising the* **Professional's** services during the period allowed for completion of the Work; and/or (b) Acting as representative for the **Owner** and for the enforcement of the Contract Documents, approving payment to the **Contractor** and coordinating the activities of the State, **Owner, Professional** and **Contractor.**

Project Schedule– Work Schedule that shows the **Contractor's** approach to planning, scheduling, and execution of the Work and that accurately portrays completed Work as to sequencing and timing, as provided in the Contract Documents.

Project Specifications– The Contract Documents organized into Divisions. "Technical Specifications" means Divisions of the Specifications consisting of technical descriptions of materials, equipment, construction systems, standards, and workmanship.

Provisionary Allowance– An amount included within the Contract Price to reimburse the **Contractor** for the cost to furnish and perform Work that is uncertain because, for example, it is indeterminate in scope and may not be shown or detailed in the Contract Documents.

Punch List– A list of minor items to be completed or corrected by the **Contractor,** any one of which do not materially impair the use of the Work for its intended purpose.

Qualified Disabled Veteran (QDV)- *QDV as defined by* Public Act 22 of 2010, MCL 18.1241.3 and supported by a DD214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

Record Documents– Drawings, Specifications, Addenda, Change Orders, Change Authorizations, Bulletins, inspection, test and approval reports, photographs, written clarifications and interpretations and all other documents recording, or annotated to show, all revisions and deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

Records– Books, reports, documents, electronic data, and other evidence relating to the bidding, award and furnishing and performance of the Work.

Recycled Material– Recycled paper products, structural materials made from recycled plastics, re-refined lubricating oils, reclaimed solvents, recycled asphalt and concrete, recycled glass products, re-treaded tires, ferrous metals containing recycled scrap metals and all other materials that contain (a) waste materials generated by a business or consumer, (b) materials that have served their intended purpose, and/or (c) materials that have been separated from solid waste for collection, recycling and disposition in the percentage determined by the State as provided by Law.

Request for Payment– The form provided by the **Owner** (Payment Request DTMB-0440) to be used by the **Contractor** in requesting payment for Work completed, which must enclose all supporting information required by the Contract Documents.

Schedule of Values– A schedule of pay items, which subdivides the Work into its various parts and which details, for each itemized part, cost and pricing information required for making payments for Work performed. The sum of all pay item costs in the Schedule of Values must equal the Contract Price for the Work.

Shop Drawings– Includes drawings, diagrams, illustrations, standard schedules, performance charts, instructions and other data prepared by or for the **Contractor** to illustrate some part of the Work, or by a Supplier and submitted by the **Contractor** to illustrate items of material or equipment.

Soil Erosion and Sedimentation Control– The planning, design and installation of appropriate Best Management Practices designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. Soil erosion and sedimentation control in the State of Michigan is regulated under The Natural Resources Environmental Protection Act; Soil Erosion and Sedimentation Control, 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq. Soil erosion and sedimentation control associated with this Contract is monitored and enforced by the DTMB-SFA.

State– The State of Michigan in its governmental capacity, including its departments, divisions, agencies, boards, offices, commissions, officers, employees, and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

State Construction Code– The Michigan State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seq.

Subcontractor– A Person having an agreement with the Contractor to provide labor at the site and furnishing materials and/or equipment for incorporation into the Work.

Submittals– Includes technical Submittals, Progress Schedules and those other documents required for submission by the Contract Documents. The term "technical Submittal" includes Shop Drawings, brochures, samples, Operation and Maintenance (O&M) Manuals, test procedures and any other Submittal the Contract Documents require the **Contractor** to submit to demonstrate how the items covered, after installation or incorporation into the Work, will conform to the information given in the Contract Documents and be compatible with the design of the completed Work as a functioning whole as indicated in the Contract Documents.

Substantial Completion– The Work, or a portion of the Work designated in the Contract Documents as eligible for separate Substantial Completion, has been completed in accordance with the Contract Documents as determined by the PSC, to the extent that the **Owner** can use or occupy the entire Work, or the designated portion of the Work, for the use intended without any outstanding, concurrent Work at the site, except as may be required to complete or correct Punch List items.

Supplier– A manufacturer or fabricator, or a distributor, material man or vendor representing a manufacturer or fabricator, who has an agreement with the Contractor to furnish materials and/or equipment.

Underground Utilities–Pipelines, piping, conduit, duct, cables, wells, tanks, tunnels and appurtenances, or other similar facilities, installed underground to convey or support conveyance of potable water, sprinkler or irrigation water, fire protection systems, electricity, gases, steam, petroleum products, sewerage and drainage removal, telephone, communications, cable TV, traffic, or control systems.

Unit Price Work– The work involving specified quantities (i.e., related Work quantities) which, when performed, is measured by the **Professional** and paid using the measured quantities and unit prices contained in the Contract Documents. Performance of Unit Price Work for undefined quantities is contingent upon conditions encountered at the site, as determined, and authorized by the **Professional**.

Unit Price Work, Specific– Work of specified and defined quantities (i.e., quantities are detailed in, and can be taken-off from, the Contract Documents) that when performed is measured by the **Professional** and paid based on the measured quantities and unit prices contained in the Contract Documents.

Work- (as in *"the Work,"* "*the entire Work"*)– The entire *completed Construction* required by the Contract Documents. The Work results from furnishing and performing all services, obligations, responsibilities, management, supervision, labor, materials, equipment, construction equipment, general conditions, permits, taxes, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, field supplies, Bonds, insurance, mobilization, close-out, overhead and all connections, devices and incidental items of any kind or nature required and/or made necessary by the Contract Documents.

Work Involved, any Work Involved– Existing or prospective Work (a) reflected in any notice, proposal, or claim, or (b) reflected in changes ordered or in process, or (c) affected by Delay.

APPENDIX II

SPECIAL WORKING CONDITIONS

RESERVED

APPENDIX III

SPECIAL PROJECT PROCEDURES

SOIL EROSION AND SEDIMENTATION CONTROL PROJECT PROCEDURES FOR CONTRACTORS ON DTMB OWNED AND MANAGED PROPERTIES

1. Comply with Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act 1994 PA 451, as amended.

2. Contact the DMVA CFMO Design and Construction Division to discuss the implementation of soil erosion and sedimentation control (SESC) on the Project with DMVA SESC Lead: Paul Bucholtz at bucholtzp@michigan.gov.

3. Following the award of a contract, the Contractor will be required to prepare and issue for approval an SESC Implementation Plan, which indicates the Contractor's intended implementation of SESC on the project including a schedule and sequence. The CFMO SESC Team, upon approval of the implementation plan, will issue to the Contractor an "Authorization to Proceed with Earth Change" document, which is to be posted at the job site. This document is issued in lieu of a permit from the county. Earthwork shall not begin prior to the issuance of this Authorization. Upon receipt of the Authorization document, the Contractor may begin earth change activities.

4. See below the "Checklist for Contractor's SESC Implementation Plan" for details of the required information necessary for the Contractor to create the SESC Implementation Plan. The intent of this plan is to ensure that the Contractor has reviewed and understands the SESC provisions within the plans and specifications.

5. CHECKLIST FOR CONTRACTOR'S SOIL EROSION AND SEDIMENTATION CONTROL IMPLEMENTATION PLAN (For projects that include earth changes or disturb existing vegetation):

DEPARTMENT OF MILITARY & VETERANS AFFAIRS
ENVIRONMENTAL SECTION, CONSTRUCTION & FACILITIES MANAGEMENT OFFICE
SOIL EROSION AND SEDIMENTATION CONTROL PROGRAM
3423 N Martin Luther King Jr. Blvd, Lansing, Michigan 48906

PROJECT TITLE:
PROJECT LOCATION:
PROJECT FILE NUMBER:
INDEX NUMBER:

Prior to the start of earthwork, the Contractor must submit a Soil Erosion and Sedimentation Control (SESC) Implementation Plan to the Michigan Department of Technology, Management and Budget, Soil Erosion and Sedimentation Control Program. The intent of this plan is to ensure that the Contractor has reviewed and understands the SESC provisions within the plans and specifications. The following checklist will provide Contractors with assistance in creating the SESC Implementation Plan.

The SESC Implementation Plan must include:

1. ☐ A written plan or letter demonstrating:
   - ☐ The Contractor's means and methods for the implementation of SESC provisions included within the plans and specifications and compliance with the provisions of Part 91 of PA 451 of 1994, as amended.
   - ☐ The Contractor's plan for dust control.
   - ☐ The Contractor's plan for inspection and maintenance of temporary SESCs.
     Contractor's primary and backup contact name, phone number (include 24-hour emergency), email, and mailing information.

2. ☐ A map, location plan, drawing, or amended copy of the Project SESC or grading plan showing:
   - ☐ The locations of any stockpiles of soil associated with the Project
   - ☐ The temporary SESC controls associated with stockpiles of soil
   - ☐ The Contractor's suggested or proposed additions or relocations of any temporary or permanent SESCs. associated with the Project plans and specifications (subject to approval by Engineer and DMVA)
   - ☐ Location of site entrances, exits and vehicle routes
   - ☐ Location of site superintendent's/project manager's site trailer or office (for SESC Inspector check-in)

3. ☐ A schedule for the installation and removal of temporary controls and the installation of permanent soil erosion and sedimentation controls in relation to the overall construction schedule.

Submit the above items to the above address.

Upon approval of the Contractor's plan, an "Authorization to Proceed with Earth Change" will be issued to the contractor or military entity by the DMVA SESC Program (APA), in lieu of an SESC permit from the county or municipality. The "Authorization to Proceed with Earth Change" form must be posted at the jobsite.

The DMVA SESC Program shall notify the county or local enforcing agency of each proposed earth change (Rule 1706).

HAZARDOUS MATERIALS PROJECT PROCEDURES

1. The Contractor must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material in accordance with all federal, state, and local Laws. If the Contractor encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the Contractor must immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions.

2. This project has been identified by the DTMB-SFA as having a possibility of containing Hazardous Waste materials to be legally removed from the Project job site to complete the Work as described in the Proposal and Contract. If removal of friable asbestos material is required, the Contractor must contact the Air Quality Division, Department of Environment, Great Lakes, and Energy, at **(5I7) 284-6773**, for a permit and furnish all training, labor, materials, services, insurance, and equipment necessary to carry out the removal operations of all Hazardous Materials from the Project job site, as identified by the Scope of Work, or encountered on the Project job site, in accordance with State and Federal Hazardous Waste Codes. A Contract Change Order will be written to modify the existing Contract to pay for the additional cost.

3. Environmental Hazards (air, water, land and liquid industrial) are handled by the Waste and Hazardous Materials Division, Michigan Department of Environment, Great Lakes, and Energy (EGLE) in carrying out the requirements of the Federal Environmental Protection Agency (EPA). For general information and/or a copy of the latest regulations and publications call (517) 335-2690.

4. The Michigan Occupational Safety and Health Administration (MIOSHA) provides protection and regulations for the safety and health of workers. The Department of Licensing and Regulatory Affairs provides for the safety of workers. The Department of Community Health provides for the health of workers (517/373-3740) (TDD 517/373-3573).

   4.1 Contractor must post any applicable State and/or Federal government regulations at the job site in a prominent location.

   4.2 Contractor must be responsible for training their workers in safe work practices and in proper removal methods when encountering hazardous chemicals.

5. Applicable Regulations:

   5.1 Natural Resources and Environmental Protection Act – PA 451 of 1994, as amended, including Part 111 – Hazardous Waste Management, Part 121 – Liquid Industrial Waste and Part 147 – PCB compounds.

   5.2 RCRA, 1976 - Resource Conservation and Recovery Act: This federal statute regulates generation, transportation, treatment, storage, or disposal of hazardous wastes nationally.

   5.3 TSCA, 1979 – Toxic Substances Control Act: This statute regulates the generation, transportation, storage, and disposal of industrial chemicals such as PCBs.

6. Definitions: Hazardous substances are ignitable, corrosive, reactive, and/or toxic, based on their chemical characteristics.

   6.1 Under Federal and Michigan Law, a Small Quantity Generator of hazardous waste provides from 220 to less than 2,000 lbs./month or never accumulates 2,200 lbs. or more.

   6.2 A Generator size provider of hazardous waste provides 2,200 lbs. or more/month or accumulates above 2,200 lbs.

7. Disposals: To use an off-site hazardous waste disposal facility, the Contractor must use the Uniform Hazardous Waste Manifest (shipping paper). Small quantities of hazardous waste may not be disposed of in sanitary landfills used for solid waste.

8. Federal, state, and local Laws and regulations may apply to the storage, handling and disposal of Hazardous Materials and wastes at each State Agency. Contact the **Environmental Assistance Center** of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) at **1-800-662-9278**, Fax to: 517-241-0673 or e-mail

to: DEQ-EAD-env-assist@michigan.gov for general EGLE information including direct and referral assistance on air, water and wetlands permits; contaminated site clean-ups; underground storage tank removals and remediation; hazardous and solid waste disposal; pollution prevention and recycling; and compliance-related assistance. The Center provides businesses, municipalities, and the public with a single point of access to EGLE's environmental programs.

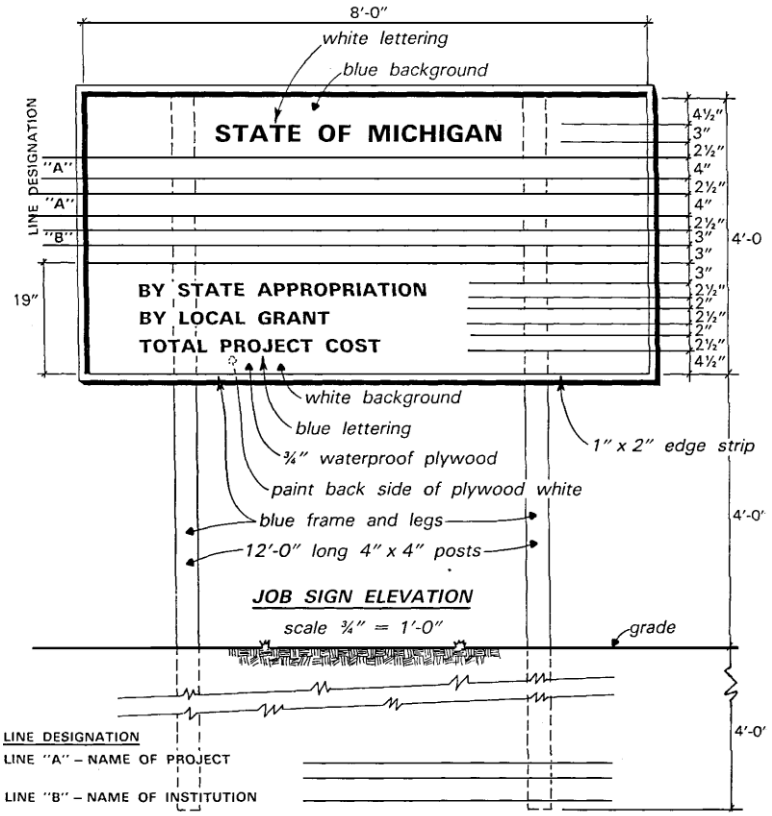
APPENDIX IV

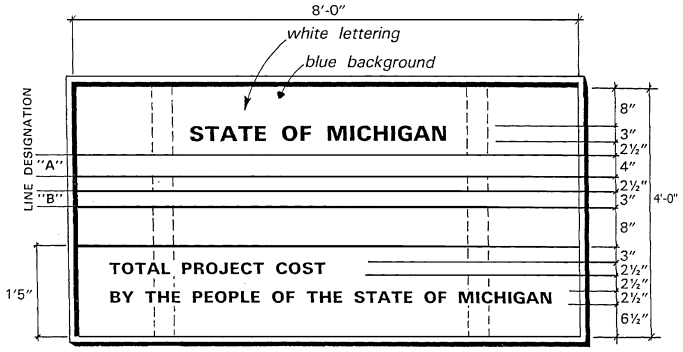
PROJECT SIGN FOR PROJECTS COSTING IN EXCESS OF $500,000

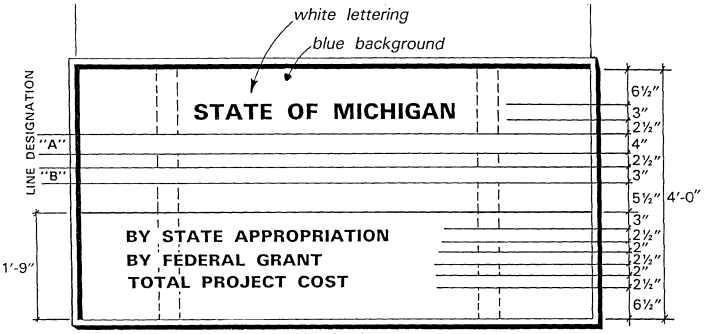
RESERVED

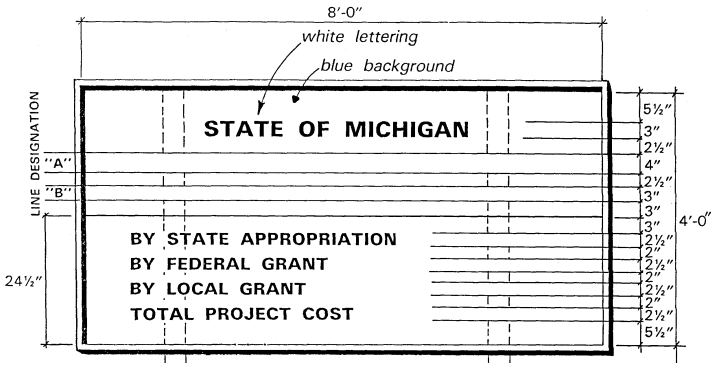
PROJECT SIGNS – PROJECTS IN EXCESS OF $500,000

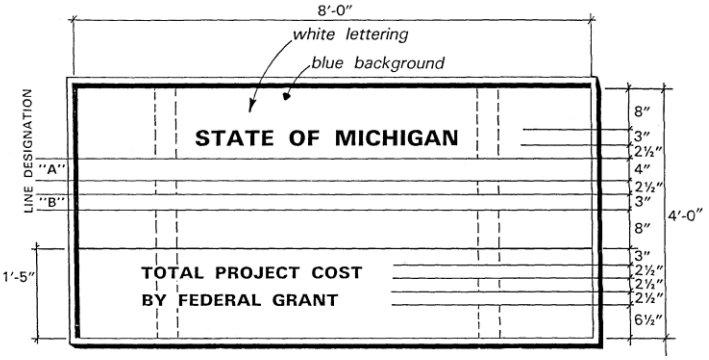
Five examples of project signs. Sign lettering corresponds with the funding arrangement of the project. Alternate signs may be considered; please contact the DTMB Project Director.











APPENDIX V

PREVAILING WAGE RATE SCHEDULES AND FEDERAL PROVISIONS ADDENDUM

For applicable additional wage schedules, refer to:
https://sam.gov/wage-determinations

"General Decision Number: MI20260158 01/02/2026

Superseded General Decision Number: MI20250158

State: Michigan

Construction Type: Heavy
HAZARDOUS WASTE REMOVAL

Counties: Michigan Statewide.

Modification Number	Publication Date
0	01/02/2026

ENGI0325-011 10/01/2011

AREA 1: GENESEE, LAPEER, LIVINGSTON, MACOMB, MONROE, OAKLAND, ST. CLAIR, WASHTENAW AND WAYNE COUNTIES

AREA 2: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LEELANAU, LENAWEE, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

	Rates	Fringes
Power equipment operators - hazardous waste removal: (AREA 1)		
AREA 1: LEVEL A		
Engineer when operating crane with boom and jib or leads 140' or longer	$ 34.68	19.70
Engineer when operating crane with boom and jib or leads 220' or longer	$ 34.98	19.70
GROUP 1	$ 32.03	19.70
GROUP 2	$ 27.80	19.70
Regular crane operator, mechanic, dragline operator, boom truck		

operator and concrete
pump with boom operator,
power shovel operator.....$ 33.00 19.70
AREA 1: LEVEL B AND C
Engineer when operating
crane with boom and jib
or leads 140' or longer....$ 33.73 19.70
Engineer when operating
crane with boom and jib
or leads 220' or longer....$ 34.03 19.70
GROUP 1.....$ 31.08 19.70
GROUP 2.....$ 26.85 19.70
Regular crane operator,
mechanic, dragline
operator, boom truck
operator and concrete
pump with boom operator,
pwer shovel operator.....$ 32.05 19.70
AREA 1: LEVEL D WHEN
CAPPING LANDFILL
Engineer when operating
crane with boom and jib
or leads 140' or longer....$ 32.18 19.70
Engineer when operating
crane with boom and jib
or leads 220' or longer....$ 32.48 19.70
GROUP 1.....$ 29.53 19.70
GROUP 2.....$ 25.30 19.70
Regular crane operator,
mechanic, dragline
operator, boom truck
operator and concrete
pump with boom operator,
power shovel operator.....$ 29.88 19.70
AREA 1: LEVEL D
Engineer when operating
crane with boom and jib
or leads 140' or longer....$ 32.43 19.70
Engineer when operating
crane with boom and jib
or leads 220' or longer....$ 32.73 19.70
GROUP 1.....$ 29.78 19.70
GROUP 2.....$ 25.55 19.70
Regular crane operator,
mechanic, dragline
operator, boom truck
operator and concrete
pump with boom operator,
power shovel operator.....$ 30.75 19.70
Power equipment operators -

hazardous waste removal:
(AREA 2)

AREA 2: LEVEL A		
Engineer when operating crane with boom and jib or leads 140' or longer	$ 32.97	19.70
Engineer when operating crane with boom and jib or leads 220' or longer	$ 33.27	19.70
GROUP 1	$ 30.32	19.70
GROUP 2	$ 25.92	19.70
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator, power shovel operator	$ 31.29	19.70
AREA 2: LEVEL B AND C		
Engineer when operating crane with boom and jib or leads 140' or longer	$ 31.91	19.70
Engineer when operating crane with boom and jib or leads 220' or longer	$ 32.23	19.70
GROUP 1	$ 29.37	19.70
GROUP 2	$ 24.98	19.70
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator, power shovel operator	$ 30.34	19.70
AREA 2: LEVEL D WHEN CAPPING LANDFILL		
Engineer when operating crane with boom and jib or leads 140' or longer	$ 30.47	19.70
Engineer when operating crane with boom and jib or leads 220' or longer	$ 30.77	19.70
GROUP 1	$ 27.82	19.70
GROUP 2	$ 23.43	19.70
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator, power shovel operator	$ 28.79	19.70
AREA 2: LEVEL D		
Engineer when operating		

crane with boom and jib		
or leads 140' or longer....$ 30.72		19.70
Engineer when operating		
crane with boom and jib		
or leads 220' or longer....$ 31.02		19.70
GROUP 1.....$ 28.07		19.70
GROUP 2.....$ 23.68		19.70
Regular crane operator,		
mechanic, dragline		
operator, boom truck		
operator and concrete		
pump with boom operator,		
power shovel operator......$ 29.04		19.70

HAZARDOUS WASTE REMOVAL CLASSIFICATIONS

Group 1: Backhoe, batch plant operator, clamshell, concrete breaker when attached to hoe, concrete cleaning decontamination machine operator, concrete pump, concrete paver, crusher, dozer, elevating grader, endloader, farm tractor (90 h.p. and higher), gradall, grader,heavy equipment robotics operator, loader, pug mill, pumpcrete machines, pump trucks, roller, scraper (self- propelled or tractor drawn), side boom tractor, slip form paver, slope paver, trencher, ultra high pressure waterjet cutting tool system, vactors, vacuum blasting machine operator, vertical lifting hoist, vibrating compaction equipment (self-propelled), well drilling rig and hydro excavator

GROUP 2: Air compressor, concrete breaker when not attached to hoe, elevator, end dumps, equipment decontamination operator, farm tractor (less than 90 h.p.), forklift, generator, heater, mulcher, pigs (portable reagent storage tanks), power screens, pumps (water), stationary compressed air plant, sweeper, welding machine and water wagon

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LABO0005-006 10/01/2022

	Rates	Fringes
Laborers - hazardous waste abatement: (ALCONA, ALPENA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET, GRAND TRAVERSE, IOSCO, KALKASKA, LEELANAU, MISSAUKEE, MONTMORENCY, OSCODA, OTSEGO, PRESQUE ISLE AND WEXFORD COUNTIES - Zone 10)		

Levels A, B or C.....$ 17.45 12.75
class b.....$ 18.64 12.90
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 16.45 12.75
class a.....$ 17.64 12.90

Zone 10

Laborers - hazardous waste abatement: (ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES - Zone 11)
Levels A, B or C.....$ 25.18 12.90
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 22.58 12.90

Laborers - hazardous waste abatement: (ALLEGAN, BARRY, BERRIEN, BRANCH, CALHOUN, CASS, IONIA COUNTY (except the city of Portland); KALAMAZOO, KENT, LAKE, MANISTEE, MASON, MECOSTA, MONTCALM, MUSKEGON, NEWAYGO, OCEANA, OSCEOLA, OTTAWA, ST. JOSEPH AND VAN BUREN COUNTIES - Zone 9)
Levels A, B or C.....$ 21.88 13.26
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 20.80 12.90

Laborers - hazardous waste abatement: (ARENAC, BAY, CLARE, GLADWIN, GRATIOT, HURON, ISABELLA, MIDLAND, OGEMAW, ROSCOMMON, SAGINAW AND TUSCOLA COUNTIES - Zone 8)
Levels A, B or C.....$ 23.74 12.95

Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....$ 20.80 12.90

Laborers - hazardous waste abatement: (CLINTON, EATON AND INGHAM COUNTIES; IONIA COUNTY (City of Portland); LIVINGSTON COUNTY (west of Oak Grove Rd., including the City of Howell) - Zone 6)

Levels A, B or C.....$ 26.33 12.95

Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....$ 24.64 12.90

Laborers - hazardous waste abatement: (GENESEE, LAPEER AND SHIAWASSEE COUNTIES - Zone 7)

Levels A, B or C.....$ 24.20 13.80

Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....$ 23.20 13.80

Laborers - hazardous waste abatement: (HILLSDALE, JACKSON AND LENAWEE COUNTIES - Zone 4)

Levels A, B or C.....$ 27.13 14.95

Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....$ 24.17 12.90

Laborers - hazardous waste abatement: (LIVINGSTON COUNTY (east of Oak Grove Rd. and south of M-59, excluding the city of Howell); AND WASHTENAW COUNTY - Zone 3)

Levels A, B or C.....$ 29.93 14.20

Work performed in

conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 28.93 14.20

Laborers - hazardous waste abatement: (MACOMB AND WAYNE COUNTIES - Zone 1)
Levels A, B or C.....$ 29.93 16.90
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 28.93 16.90

Laborers - hazardous waste abatement: (MONROE COUNTY - Zone 4)
Levels A, B or C.....$ 31.75 14.90
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 31.75 14.90

Laborers - hazardous waste abatement: (OAKLAND COUNTY and the Northeast portion of LIVINGSTON COUNTY bordered by Oak Grove Road on the West and M-59 on the South - Zone 2)
Level A, B, C.....$ 29.93 16.90
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 28.93 16.90

Laborers - hazardous waste abatement: (SANILAC AND ST. CLAIR COUNTIES - Zone 5)
Levels A, B or C.....$ 26.21 16.62
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;
Also, Level D.....$ 24.75 16.35

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications

and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates

reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION
"

Federal Provisions Addendum

This addendum applies to purchases that will be paid for in whole or in part with funds obtained from the federal government. The provisions below are required and the language is not negotiable. If any provision below conflicts with the State's terms and conditions, including any attachments, schedules, or exhibits to the State's Contract, the provisions below take priority to the extent a provision is required by federal law; otherwise, the order of precedence set forth in the Contract applies. Hyperlinks are provided for convenience only; broken hyperlinks will not relieve Contractor from compliance with the law.

1. Equal Employment Opportunity

If this Contract is a "**federally assisted construction contract**" as defined in 41 CFR Part 60-1.3, and except as otherwise may be provided under 41 CFR Part 60, then during performance of this Contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Davis-Bacon Act (Prevailing Wage)

If this Contract is a **prime construction contracts** in excess of $2,000, the Contractor (and its Subcontractors) must comply with the Davis-Bacon Act (40 USC 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”), and during performance of this Contract the Contractor agrees as follows:

(1) All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.
(2) Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.
(3) Additionally, contractors are required to pay wages not less than once a week.

3. Copeland "Anti-Kickback" Act

If this Contract is a contract for construction or repair work in excess of $2,000 where the Davis-Bacon Act applies, the Contractor must comply with the Copeland "Anti-Kickback" Act (40 USC 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"), which prohibits the Contractor and subrecipients from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled, and during performance of this Contract the Contractor agrees as follows:

(1) Contractor. The Contractor shall comply with 18 U.S.C. §874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.
(2) Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA or the applicable federal awarding agency may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
(3) Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a Contractor and Subcontractor as provided in 29 C.F.R. § 5.12.

4. Contract Work Hours and Safety Standards Act

If the Contract is **in excess of $100,000** and **involves the employment of mechanics or laborers**, the Contractor must comply with 40 USC 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5), as applicable, and during performance of this Contract the Contractor agrees as follows:

(1) Overtime requirements. No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The State shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. Rights to Inventions Made Under a Contract or Agreement

If the Contract is funded by a federal "funding agreement" as defined under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

6. Clean Air Act and the Federal Water Pollution Control Act

If this Contract is **in excess of $150,000,** the Contractor must comply with all applicable standards, orders, and regulations issued under the Clean Air Act (42 USC 7401-7671q) and the Federal Water Pollution Control Act (33 USC 1251-1387), and during performance of this Contract the Contractor agrees as follows:

Clean Air Act

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

2. The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.

3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

Federal Water Pollution Control Act

1. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

2. The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.

3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

7. Debarment and Suspension

A "contract award" (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (51 FR 6370; February 21, 1986) and 12689 (54 FR 34131; August 18, 1989), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(1) This Contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the Contractor is required to verify that none of the Contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) The Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(3) This certification is a material representation of fact relied upon by the State. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the State, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

8. Byrd Anti-Lobbying Amendment

Contractors who apply or bid for an award of **$100,000 or more** shall file the required certification in Exhibit 1 – Byrd Anti-Lobbying Certification below. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

9. Procurement of Recovered Materials

Under 2 CFR 200.322, Contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act.

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—

1. Competitively within a timeframe providing for compliance with the contract performance schedule;

2. Meeting contract performance requirements; or

3. At a reasonable price.

(2) Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive- procurement-guideline-cpg-program.

(3) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

10. Additional FEMA Contract Provisions.

The following provisions apply to purchases that will be paid for in whole or in part with funds obtained from the Federal Emergency Management Agency (FEMA):

(1) Access to Records. The following access to records requirements apply to this contract:

a. The Contractor agrees to provide the State, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

b. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

c. The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

d. In compliance with the Disaster Recovery Act of 2018, the State and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

(2) Changes.

See the provisions regarding modifications or change notice in the Contract Terms.

(3) DHS Seal, Logo, And Flags

The Contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval.

(4) Compliance with Federal Law, Regulations, and Executive Orders

This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The Contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.

(5) No Obligation by Federal Government

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the State, Contractor, or any other party pertaining to any matter resulting from the Contract."

(6) Program Fraud and False or Fraudulent Statements or Related Acts

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

Exhibit 1 - Byrd Anti-Lobbying Certification

Contractor must complete this certification if the purchase will be paid for in whole or in part with funds obtained from the federal government and the purchase is greater than $100,000.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor,_____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____

Signature of Contractor’s Authorized Official

_____

Name and Title of Contractor’s Authorized Official

_____

Date

§ 200.322 Domestic Preferences for Procurements

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

FEDERAL FUNDED CONTRACT REGISTRATION REQUIREMENTS

Each primary contracted contractor with the DTMB must register with the Federal System for Award Management (SAM) must register prior to contract execution. The SAM website is https://sam.gov/content/home. The direct hyperlink for SAM.gov registration is https://sam.gov/content/entity-registration

The Federal government will use a Unique Entity Identifier (UEI) created in SAM.gov as the official subrecipient identifier. All primary contracted contractors with the DTMB will be required to maintain an active registration on SAM.gov. To receive payment, all primary contracted vendors need to have a Unique Entity Identifier (UEI) number and have the UEI entered in their SIGMA account. Information on the UEI and sign up can be obtained at: https://www.gsa.gov/about-us/organization/federal-acquisition-service/fas-initiatives/integrated-award-environment/iae-systems-information-kit/unique-entity-id-is-here

Contractor is to fill in and provide the following documentation for use in SLFRF reporting prior to Contract Execution for use in the reporting requirements:

Contractor's UEI _____

Contractor's Full Legal Name _____

Primary Point-of-Contact Email Address _____

Business Address _____

City Business is located _____

State Business is located _____

US Zip Code + 4 digits _____

APPENDIX VI

Range 5
2021 Laboratory Reports
And
Field Sample Location Map

Fibertec
environmental
services

Thursday, September 30, 2021

Fibertec Project Number:	A04138
Project Identification:	Fort Custer (1941-6940-21) /1941-6940-21
Submittal Date:	09/21/2021

Mr. Brian Huggett
Michigan Army National Guard, CFMO Env.
Invoice sent to: Lansing Res. Forces Support Center, CFMO Env.
3423 N. Martin Luther King Jr. Blvd.
Lansing, Michigan 48906

Dear Mr. Huggett,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Sue Ricketts

By Sue Ricketts at 1:20 PM, Sep 30, 2021

For Daryl P. Strandbergh
Laboratory Director

Enclosures

Client Identification:	**Michigan Army National Guard, CFMO Env.**	Sample Description:	**Range 5 (0-1.5')**	Chain of Custody:	**146347**
Client Project Name:	**Fort Custer (1941-6940-21)**	Sample No:		Collect Date:	**09/21/21**
Client Project No:	**1941-6940-21**	Sample Matrix:	**Soil/Solid**	Collect Time:	**08:05**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Toxicity Characteristic Leaching Procedure (TCLP) **Aliquot ID: A04138-003** **Matrix: Soil/Solid**
Method: EPA 1311 **Description: Range 5 (0-1.5')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. TCLP Date	**9/24/2021**		NA	NA	1.0	NA	NA	09/24/21	NA	TDJ

Trace Elements by ICP/MS **Aliquot ID: A04138-003** **Matrix: Soil/Solid**
Method: EPA 0200.2/EPA 6020A **Description: Range 5 (0-1.5')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Copper	**190000**		µg/kg	1000	20	09/28/21	PT21I28D	09/28/21	T421I28A	CJA
2. Lead	**3100000**		µg/kg	10000	1000	09/28/21	PT21I28D	09/29/21	T421I29A	CJA

Client Identification:	**Michigan Army National Guard, CFMO Env.**	Sample Description:	**Range 5 (0-1.5')**	Chain of Custody:	**146347**
Client Project Name:	**Fort Custer (1941-6940-21)**	Sample No:		Collect Date:	**09/21/21**
Client Project No:	**1941-6940-21**	Sample Matrix:	**Soil/Solid**	Collect Time:	**08:05**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TCLP Metals by ICP/MS **Aliquot ID: A04138-003A** **Matrix: TCLP Extract**

Method: EPA 3005A (Total Recoverable)/EPA 6020A **Description: Range 5 (0-1.5')**

						Preparation		Analysis		
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	P. Date	P. Batch	A. Date	A. Batch	Init.
1. Copper	**9.8**		mg/L	1.0	20	09/27/21	PT21I27C	09/27/21	T421I27A	CJA
2. Lead	**140**		mg/L	1.0	100	09/28/21	PT21I27C	09/28/21	T421I28A	CJA

Client Identification:	**Michigan Army National Guard, CFMO Env.**	Sample Description:	**Range 5 (1.5-3')**	Chain of Custody:	**146347**
Client Project Name:	**Fort Custer (1941-6940-21)**	Sample No:		Collect Date:	**09/21/21**
Client Project No:	**1941-6940-21**	Sample Matrix:	**Soil/Solid**	Collect Time:	**08:15**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Toxicity Characteristic Leaching Procedure (TCLP) **Aliquot ID: A04138-004** **Matrix: Soil/Solid**
Method: EPA 1311 **Description: Range 5 (1.5-3')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. TCLP Date	**9/24/2021**		NA	NA	1.0	NA	NA	09/24/21	NA	TDJ

Trace Elements by ICP/MS **Aliquot ID: A04138-004** **Matrix: Soil/Solid**
Method: EPA 0200.2/EPA 6020A **Description: Range 5 (1.5-3')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Copper	**150000**		µg/kg	1000	20	09/28/21	PT21I28D	09/28/21	T421I28A	CJA
2. Lead	**1700000**		µg/kg	10000	1000	09/28/21	PT21I28D	09/29/21	T421I29A	CJA

Client Identification:	**Michigan Army National Guard, CFMO Env.**	Sample Description:	**Range 5 (1.5-3')**	Chain of Custody:	**146347**
Client Project Name:	**Fort Custer (1941-6940-21)**	Sample No:		Collect Date:	**09/21/21**
Client Project No:	**1941-6940-21**	Sample Matrix:	**Soil/Solid**	Collect Time:	**08:15**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TCLP Metals by ICP/MS **Aliquot ID: A04138-004A** **Matrix: TCLP Extract**

Method: EPA 3005A (Total Recoverable)/EPA 6020A **Description: Range 5 (1.5-3')**

						Preparation		Analysis		
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	P. Date	P. Batch	A. Date	A. Batch	Init.
1. Copper	**26**		mg/L	1.0	20	09/27/21	PT21I27C	09/27/21	T421I27A	CJA
2. Lead	**200**		mg/L	1.0	200	09/28/21	PT21I27C	09/28/21	T421I28A	CJA

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QC limits

Exception Summary:

Analysis Locations:

All analyses performed in Holt.

Accreditation Number(s):

T104704518-19-8 (TX)

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Industrial Hygiene Services, Inc.
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0382
email: asbestos@fibertec.us

Geoprobe
11766 E. Grand River
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # **146347**
PAGE 1 of N

Client Name: DLZ
Contact Person: MIKE TUCKER
Project Name/ Number: FORT CUSTER 1941-6940-21
QUOTE# USE STATE OF MICHIGAN OVERFLOW LAB PRICING
Purchase Order#

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: TCLP LEAD	TCLP COPPER	TOTAL LEAD	TOTAL COPPER
	9/21/2021	7:45		RANGE 6 (0-1.5')	S	1	N	X	X	X	X
		8:00		RANGE 6 (1.5-3')	S	1	N	X	X	X	X
		8:05		RANGE 5 (0-1.5')	S	1	N	X	X	X	X
		8:15		RANGE 5 (1.5-3')	S	1	N	X	X	X	X
		8:25		RANGE 4 (0-1.5')	S	1	N	X	X	X	X
		8:40		RANGE 4 (1.5-3')	S	1	N	X	X	X	X
		8:45		RANGE 3 (0-1.5')	S	1	N	X	X	X	X
		8:50		RANGE 3 (1.5-3')	S	1	N	X	X	X	X
		9:00		RANGE 2 (0-1.5')	S	1	N	X	X	X	X
		9:05		RANGE 2 (1.5-3')	S	1	N	X	X	X	X

Turnaround
- [ ] 24 hour RUSH (surcharge applies)
- [ ] 48 hour RUSH (surcharge applies)
- [ ] 72 hour RUSH (surcharge applies)
- [X] Standard (5-7 bus. days)
- [ ] Other: Specify

Matrix Code
S Soil, A Air, O Oil, P Wipe, GW Ground Water, SW Surface Water, WW Waste Water, X Other: Specify

Deliverables
- [ ] Level 2
- [ ] Level 3
- [ ] Level 4
- [ ] EDD

[ ] FES Drilling Services

Remarks: "DO NOT REMOVE LARGER PARTICLES/PEBBLES/BULLETS"

Received By Lab
SEP 21 2021
Initials: CI

Comments:

	Date/ Time	
Relinquished By: Mike Tucker	9-21-21 940	Received By:
Relinquished By:	Date/ Time	Received By:
Relinquished By:	Date/ Time	Received By Laboratory:

LAB USE ONLY:
Fibertec project number: A04138
Laboratory Tracking:
Temperature at Receipt: N/A

COC Revision: February, 2013

TERMS & CONDITIONS ON BACK


Range 5
SAMPLE LOCATION ON BERM FACE FOR COMPOSITE SAMPLE COLLECTION
SAMPLE EXCAVATIONS ARE APPROXIMATELY 6 FEET UP FROM THE BASE OF THE BERM
RANGE 5
TARGET
BASE OF BERM
TOP OF BACKSTOP BERM
BULLET IMPACT POCKET
N
25
Feet

APPENDIX VII

Unified Facilities Criteria
Small Arms Ranges

UFC 4-179-02
5 March 2020
Change 1, 13 March 2025

UNIFIED FACILITIES CRITERIA (UFC)

SMALL ARMS RANGES

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UNIFIED FACILITIES CRITERIA (UFC)

SMALL ARMS RANGES

Indicate the Military Department Preparing Activity responsible for the document.

U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER CENTER

Record of Changes (changes are indicated by **\1** ... **/1/**)

Change No.	Date	Location
1	13 Mar 2025	Multiple CCRs, allowed granular rubber traps for all Services, and clarified the criteria for prohibiting A/C in most indoor ranges.

This UFC supersedes MIL-HDBK 1027/3B, dated November 1992 and ETL 11-18 dated November 2018.

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FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD (AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States, its territories, and possessions is also governed by Status of Forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA). Therefore, the acquisition team must ensure compliance with the most stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

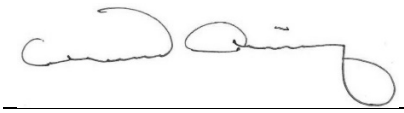
UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Military Department's responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Systems Command (NAVFAC), and Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system. Technical content of UFC is the responsibility of the cognizant DoD working group. Defense Agencies should contact the respective DoD Working Group for document interpretation and improvements. Recommended changes with supporting rationale may be sent to the respective DoD working group by submitting a Criteria Change Request (CCR) via the Internet site listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide website https://www.wbdg.org/dod.

Refer to UFC 1-200-01, *DoD Building Code*, for implementation of new issuances on projects.

AUTHORIZED BY:



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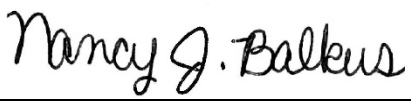

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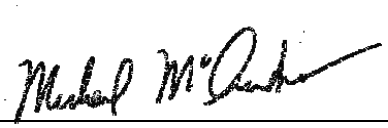

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UNIFIED FACILITIES CRITERIA (UFC)

NEW SUMMARY SHEET

Document: UFC 4-179-02, Small Arms Range Criteria.

Superseding: Navy MIL HNDBK 1027/3B and Air Force ETL 11-18.

Description: This UFC-4-179-02 replaces the superseded documents above and provides Tri Service criteria applicable all new DoD indoor, outdoor, and steel close quarter combat small arms range facilities. This UFC establishes existing Army and USMC Surface Danger Zone criteria as Tri Service criteria and references other Department of Defense (DoD) range criteria where appropriate.

Reasons for Document:

- The new UFC updates and consolidates various service range guidance into one Tri Service document and addresses many areas not covered in existing DoD range criteria.
- The superseded documents included requirements that were inconsistent between each other and other service practices.

Impact:

This unification effort will result in more consistent requirements across DoD and will increase DoD range safety, improve training, and reduce costs in the following ways:

- Provides new and updated criteria that is consistent throughout DoD and a centralized source to share and apply lessons learned.
- Improves indoor range ventilation designs which in turn reduces the chance of overexposure to airborne contaminants.
- Improves indoor range noise attenuation designs which in turn reduces the impacts of harmful noise to personnel at the range.
- Highlights exterior noise concerns and thus reduces noise to neighboring areas.
- Increases awareness of indoor range options and capabilities. This allows for facilities that improve training to warfighters.
- Provides criteria on steel CQC facilities which is currently absent in DoD.
- Provides suppliers with consistent standards thus simplifying procurement of range equipment for both DoD and contractors.

Unification Issues:

General:

Several service specific planning and layout requirements are included since:

- The Army has extensive planning criteria for outdoor ranges. The Air Force has detailed planning requirements for the indirect support area of indoor ranges. The Navy has no separate range planning criteria.

- Training requirements vary between the services, and this dictates different range requirements and layouts.

Outdoor ranges:

The Army, Navy, and USMC use DA PAM 385-63 and MCO 3570 for SDZ criteria. The Air Force uses horizontal distances listed in these criteria but different distances for the vertical component of the Surface Danger Zone. A separate table with vertical components is included for Air Force use.

Services have different access, signage, and marking requirements. A statement is made to use service installation guidance.

The Army, USMC, and Air Force allow machine gun training on tube ranges. These tube ranges do not support traverse firing that is required for maritime machine gun training. A statement is made not to use tube ranges for Navy machine gun qualifications.

Indoor Ranges:

\1\ /1/

The Air Force requires a raised floor in the range control booth. The other services do not. A note is included to use raised floors on Air Force projects.

CQC Facilities and Shoothouses:

The Army allows an option to glue splatter protection directly to the ballistic panels in steel shoothouses. The Navy requires an air gap between steel panels and the splatter protection to facilitate inspections and to increase the life of the splatter protection. Service specific guidance is provided.

The Army uses Shock Absorbing Concrete (SACON) as an option for ballistic walls and does not require a ballistic roof when an SDZ waiver is obtained. The Navy only uses steel shoothouses with steel ballistic panels and overhead ballistic containment. This criteria only covers steel shoothouses with a ballistic roof and refers to Army when designing SACON shoothouses.

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CHAPTER 1 INTRODUCTION

1-1 PURPOSE AND SCOPE.

This Unified Facility Criteria (UFC) provides requirements for DoD small arms range facilities.

1-2 APPLICABILITY.

This UFC follows the same applicability as UFC 1-200-01, paragraph 1-3, for indoor, outdoor, and steel Close Quarter Combat (CQC) small arms range facilities (also known as shoothouses).

1-3 OTHER CRITERIA.

1-3.1 General Building Requirements.

Comply with UFC 1-200-01, *DoD Building Code*. UFC 1-200-01 provides applicability of model building codes and government unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, security, high performance and sustainability requirements, and safety. Use this UFC in addition to UFC 1-200-01 and the UFCs and government criteria referenced therein.

1-3.2 Antiterrorism and Security.

UFC 4-020-01 supports the planning of DoD facilities that include requirements for security and antiterrorism. Use UFC 4-020-01 in conjunction with UFC 4-010-01 to establish the security and antiterrorism design criteria that will be the basis for DoD facility designs. All DoD facilities must also comply with Geographic Combatant Commander antiterrorism construction standards for antiterrorism requirements.

1-3.3 Sustainability.

For indoor ranges, the indirect support areas must meet UFC 1-200-02. The design of the training and direct support areas is driven by containment and ventilation criteria and must meet UFC 1-200-02 to the extent practical.

1-3.4 Service Specific DoD Range Criteria.

- AR 350-19.
- AR 350-52.
- DA PAM 385-63.
- TC-25-8.
- MCO 3570.1.
- FC 4-179-03F.

- AF 36-2654. **\1** (Soon to be replaced with DAFI31-131 and DAFMAN31-131 V1) **/1/**

1-3.5 Army Ranges.

Range layouts, target distances, lane widths, target systems, and baffle effects are standard and defined by the Training Circular TC 25-8. Specific range design requirements are as defined in the Range Design Guide (RDG).

1-3.6 Non-Standard Ranges.

For non-standard ranges that do not have applicable criteria in this UFC, consult with the specific service range subject matter expert.

1-4 CYBERSECURITY.

All facility-related control systems (including systems separate from a utility monitoring and control system) must be planned, designed, acquired, executed, and maintained in accordance with UFC 4-010-06, and as required by individual Service Implementation Policy.

1-5 BEST PRACTICES.

Appendix A contains best practices.

1-6 WEAPONS AND AMMUNITION.

Appendix B contains a general description of common weapons and ammunition used by DoD.

1-7 GLOSSARY.

Appendix C contains acronyms, abbreviations, and terms.

1-8 REFERENCES.

Appendix D contains a list of references used in this document. The publication date of the code or standard is not included in this document. Unless otherwise specified, the most recent edition of the referenced publication applies.

CHAPTER 2 GENERAL

2-1 PLANNING.

Design ranges to meet the need of the intended training. Consider the number of shooters and firing lanes, anticipated weapons and ammunition, target systems, target distances, scoring accuracy required, shooting directions and angles, and components necessary to maintain and support the range. Establish a team to review range requirements and develop the project. The team composition will depend on the service but in general should include service range experts, weapons and range safety officers, organizational range safety personnel, trainers, industrial hygienists, activity planners, project managers, fire protection and environmental personnel, and others that will be involved in operations and maintenance of the facility. For outdoor ranges plot the proposed Surface Danger Zone (SDZ) and check for conflicts early in the planning phase. Check aircraft operations and contact the Federal Aviation Administration (FAA) if there is a vertical weapon component that could endanger aircraft.

2-2 BASIS OF DESIGN.

For the initial design submittal include a separate document outlining the parameters and assumptions on which the range design is based. All range design parameters should be provided or verified by the service's range safety program. This information will help ensure the range is operated and maintained with appropriate restrictions and should include:

All Ranges:

- The most powerful rounds in terms of energy and maximum distance.
- A sketch for indoor ranges and a Geographic Information System (GIS) map for outdoor ranges showing location of all firing lines, target lines, direction of fire, and left and right limits.
- Maximum target distance provided.
- Target systems.
- Assumptions used for sizing range support areas including the number of targets, weapons, and students.

Outdoor Ranges:

- A Surface Danger Zone (SDZ) map provided by the government annotated to show the location of SDZ enforcement features including topography, range fencing, base limits, signage, and road barriers.
- A list of recommended best management practices.

Indoor Ranges and CQC Facilities:

- A sketch showing the location and maintenance access to all range equipment and controls including targeting systems, ventilation equipment, filters, trap equipment, dust collection system, bullet collection components, and lighting controls.
- A floor plan showing live fire areas with direction of fire and any limitations imposed such as areas or walls not designed for live fire.
- A floor plan showing range support functions such as classrooms armories, offices, simulators etc.
- Bullet trap and ventilation operation and maintenance manuals provided at end of project.

2-3 MATERIAL.

2-3.1 Concrete.

All concrete that may receive bullet strikes must be minimum 3500 psi (24 MPa). Structural design may require higher strengths.

2-3.2 Ballistic and \1\ Abrasion Resistant (AR) /1/ Steel Plate.

Ballistic steel plate and AR Steel Plate must be tested in accordance with ASTM E10-08, meet MIL-A-46100, and certified as having the following Brinell Hardness (HBW):

- AR500: HBW between 470 and 544.
- AR525: HBW between 500 and 544.

In addition, require:

- Certifications for all ballistic steel plates.
- **\1** Only steel bullet trap component exposed to bullet impact are required to meet both ASTM E10-08 and MIL-A-46100 certification requirements.**/1/**
- Connection made in such a manner as to maintain ballistic properties.
- All cuts made in a manner that does not alter or reduce hardness.
- Ballistic integrity maintained across all joints.

2-3.3 Splatter Protection for Overhead Baffles and Safety Ceiling.

Splatter protection must have spacers providing minimum 1-1/2” (38 mm) air gap between splatter protection and the underlying material with the exception that Army ranges may have splatter protection glued directly to the underlying material. Splatter

protection material must be fire resistant and must not contain any metal or metal fibers, excluding fasteners. Design splatter protection to allow for removal and replacement without damage to the splatter protection, spacers, or underlying material. Choose from among the following:

- 0.375 in. (9.5 mm) two-ply rubber conveyor belt material. Must not contain any metal.
- 2 in. (50 mm) thick vulcanized rubber.
- 2 in. (50 mm) cold-pressed ballistic rubber.
- Minimum 0.75 in. (19 mm) fire-retardant plywood.
- Other material may be used when approved.
- Acoustic material with tests results showing material can stop splatter from rifle rounds after striking underlying steel plates.
- Spacer material may be wood, light-gauge steel channels, or recycled plastic lumber.

2-3.4 Splatter Protection for Steel CQC Facilities.

Choose splatter protection options that provide:

- Containment of splatter within wall.
- Capability to easily remove and replace to allow inspection of ballistic steel.
- Ease of maintenance.
- Fire resistance.

For Navy projects, use spacers that provide a 1.5-in. (37 mm) air gap between steel and splatter protection to reduce damage to backside of splatter protection and simplify removal for routine inspection of ballistic steel panels. Army facilities may have splatter protection glued directly to the ballistic panels.

2-4 AIR FORCE RANGES.

The Air Force allows only outdoor non-contained, machine gun tube, or fully enclosed indoor ranges for new construction. The following applies to Air Force indoor and outdoor small arms ranges.

2-4.1 Firing Line Positions and Platforms.

All small arms ranges should have a minimum of seven positions at the firing line. Additional positions may be added in increments of seven. The width of the firing

position must be at least 5 ft. (1.5 m) center-to-center. The firing line must be located on a stable horizontal surface with a clear distance that is at least 14 ft. (4.3 m) in depth for the length of the firing line. For most ranges, the firing platform is a concrete slab on grade. For ranges that have fighting positions dug in the ground, sandbags, or other definite structures to identify the firing line, the firing platform can be an earth surface. For special weapons, Combat Arms (CA) personnel will specify the number of firing positions and the widths of each position based on training requirements.

2-4.2 Position Numbering.

Number each firing position beginning from the left when facing the target line. The numbers must be at least 8 in. (200 mm) tall and displayed on rectangular backgrounds attached to the position barricade or other location that is clearly visible to all shooters and range officials. Mark odd-numbered positions with white numbers on a black background. Mark even-numbered positions with black numbers on a white background.

2-4.3 Position Barricades.

Install a wooden barricade, or equivalent, in the form of a cross at the left edge of each firing position with the following requirements:

- The nominal dimensions of the wood horizontal member must be the 2 in. (50 mm) by 6 in. (150 mm).
- The top surface of the horizontal member must be 48 in. (1220 mm) above the floor with a 12 in. (300 mm) resting surface on each side of the post.
- Post member may be nominal 2 in. (50 mm) by 6 in. (150 mm) or 4 in. (100 mm) by 4 in. (100 mm) wood.

2-4.4 Firing Line.

Paint a red line a minimum of 4 in. (100 mm) wide on the leading edge of the firing line on the target side. For ranges without firing line platforms or concrete floor, a firing line may be marked in red on the downrange side of the firing positions with treated timber embedded along the firing line. If not painted in red, this can also be a line of safety cones or other method that clearly marks the location. This is the stationary firing line and must be continuous for the full length of all firing positions. For move and shoot courses, the firing line is relocated downrange as appropriate for the training scenarios.

2-4.5 Light Anti-Tank Weapons (LAW) and 40 mm Grenades.

See Chapter 3 paragraphs on “Surface Danger Zones”.

2-5 ARMY AND USMC RANGES.

For planning Army ranges follow AR 350-19. Army ranges must be approved and included on the installations Range Complex Master Plan (RCMP).

- Use US Army TC 25-8 and DA PAM 385-63 for range layout.
- Use the RDG for range design details, standard features, and target system interface.

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CHAPTER 3 OUTDOOR RANGES

3-1 PLANNING AND DESIGN.

Safety is the primary concern when selecting a site for an outdoor small arms range. Other critical concerns include training capability, compatible use, travel distance, location of utilities, and unexploded ordinance (UXO) risk assessment.

3-2 SURFACE DANGER ZONES.

Surface Danger Zones (SDZs) include both horizontal and vertical components and will be developed by the Government during the planning phase in accordance with DA PAM 385-63/MCO 3570. The designer should familiarize themselves with the SDZ as it impacts the location and layout of the firing lines, target lines, berms, supporting features, and downrange features. Orient the SDZ horizontal and vertical components to minimize the effect of range operations on populated areas, watercraft operations, public waterways, aircraft ground and air operations, and land uses within the maximum range of the ammunition. Available land for the SDZ controls the type and size of the range. Consider future expansion when choosing the site and developing SDZs. As weapons and ammunition improve, they are often more powerful than their replacements and therefore require larger SDZs. All mapping must be done using a geographic information system (GIS).

3-2.1 Air Forces Ranges.

The Vertical Danger Zone (VDZ) component of the SDZ will be developed using Table 3-1. For VDZ in excess of 200 ft. (61 m) in height, coordinate with the local airfield manager. In some cases, Light Anti-Tank Weapons (LAW) and 40 mm grenade launchers are employed adjacent to, or overlapping, the small arms range footprint. For specialized weapons such as the LAW and 40 mm grenades on outdoor non-contained small arms ranges, DA PAM 385-63 will be used to develop surface danger zone and range design criteria.

Table 3-1 Air Force Minimum VDZ Height Requirements

Weapon/Caliber	DOD Identification Code (DODIC)	Ammunition Nomenclature	Minimum VDZ Height[5] Feet (Meters)
Pistol, 9 mm (M9, M11, GLOCK 19) and Submachine Gun, 9 mm (MP5 and UZI)	A363, A360	Cartridge (Ctg), 9 mm Ball NATO and Cartridge 9 mm Ball Parabellum (M882, M1)	2215 (675)
Pistol, 9 mm (M9, M11, GLOCK 19)	AA16	9 mm Ctg Frangible (MK254-0)	2215 (675)[1]
Pistol, 9 mm (M9, M11, GLOCK 19)	AB13, AB14	9 mm Blue (Red) Marking Ctg (M1041)	328 (100)[4]
Handgun, .44 magnum		Commercial Local Purchase	2965 (904)[2]
Shotgun, 12 Gauge	A011, AA51, AA82	Ctg 12 Gauge (GA) Shotgun 00 Buckshot, Frangible, Non-Lethal Fin Stabilized (M19/M162, M1012)	1083 (330)
Shotgun, 12 Gauge	A023	Ctg 12 GA 1 OZ Slug	2706 (825)[2]
Shotgun, 12 Gauge	AA52	Ctg 12 GA Non-Lethal Crowd Control (M1013)	328 (100)
Rifle/Carbine, 5.56 mm (M4, M4A1 and all M16 series weapons)	A071, A068	Ctg 5.56 mm Ball, Ctg 5.56 mm Tracer (M193, M196)	3347 (1020)
Rifle/Carbine/Automatic Rifle, 5.56 mm (M4, M4A1, all M16 series weapons and M249)	A059, A063/Linked A062, A064, AA01	Ctg 5.56 mm Ball, Ctg 5.56 mm Tracer (includes ball, tracer, armor piercing [AP] and AP tracer linked) (M855, M856, M995)	3674 (1120)
Rifle/Carbine, 5.56 mm (M4, M4A1 and all M16 series weapons)	AA68	5.56 mm Plastic (M862)	328 (100)[4]
Rifle/Carbine/Automatic Rifle, 5.56 mm (M4, M4A1, all M16 series weapons and M249)	AA40/Linked AA85	Ctg 5.56 mm Frangible Ball and Ctg 5.56 mm Frangible Linked	3347 (1020)[1]
Rifle/Carbine/Automatic Rifle, 5.56 mm (M4, M4A1, all M16 series weapons and M249)	AB09, AB10/Linked AA85	5.56 mm Blue (Red) Marking Ctg/Blue (Red) Linked Marking Ctg (M1042)	328 (100)[4]
Rifle/Carbine/Automatic Rifle, 5.56 mm (M4, M4A1, all M16 series weapons and M249)	AB67, AB66	5.56 mm, XM1037 Short Range Training Ammunition (SRTA) (Includes Single Round and Linked) (M1037)	656 (200)[4]

Weapon/Caliber	DOD Identification Code (DODIC)	Ammunition Nomenclature	Minimum VDZ Height[5] Feet (Meters)
Rifle/Machine Gun, 7.62 mm (M110, M14, MK14 EBR, M21, M24 and M240)	A122, A130, A140, A146, AB50/ Linked A168, A127, A128, A131, A143, A151, A164, A165, A168, A257	Ctg 7.62 mm Ball (M80) and Ctg 7.62 mm Tracer (M62) (Includes Linked and Ball/Tracer Linked) (M80, M62, M276, MK319-0)	4478 (1365)
Rifle/Machine Gun, 7.62 mm (M110, M14, MK14 EBR, M21, M24 and M240)	AA11	Ctg 7.62 mm NATO M118 Special Ball (M118)	4856 (1480)
Machine Gun, 7.62 mm (M240)	AA37, AB60	7.62 mm, M973/M974 Short Range Training Ammunition (SRTA) 4/1 and (Includes Ball Linked) (M973 and M974)	656 (200)[4]
Rifle, .50 caliber (M107)	A525, A552, A571, AA50, A606, A605	Ctg Cal .50 Ball, Tracer, Armor Piercing (AP), AP Incendiary (I) and API Tracer (Mark 211 Mod O, M2, M1, M10, M33, M17, M8, M20)	6365 (1940)
Machine Gun/Rifle, .50 caliber (M2)	A530, A532, A533, A543, A545, A546, A555, A557, A564, A575, A576, A584, A602, A606, A641, AA06	Ctg Cal .50 Ball, Tracer, AP, Incendiary (I), API and API Tracer Linked (M8 API, M2 AP, M20, M1, M33 Ball, M2 Ball, M17, M10, M17, Spotter Tracer)	6365 (1940)
Grenade Launcher, 40mm (M203, M320)	B470, B472, B506, B508, B509, B519, B535, B536, B537, B538, B542, B546, B568, B576, B584	40mm Ctg, HE, HEDP, TP, Practice, Smoke, Illumination (M381, M384, M385, M386, M406, M407A1, M430, M433, M441, M661, M662, M583A1, M992, M713, M715, M716, M781, M918)	708 (216)[3]
Grenade Launcher, 40mm (M203, M320)	BA06	40mm Ctg Non-Lethal Sponge (M1006)	328 (100)
Grenade Launcher, 40mm (M203, M320)	B534	40mm Ctg, Multi Projectile (M576)	246 (75)
Machine Gun, 40mm Linked (MK19)	BA30, B542, B576, B584, BA32, BA21, BA12	Ctg 40mm Linked HEDP, TP, Practice, Mixed (M430/M918/M385/M385A1/M918 & M385/ MK281)	1565 (477)[3]
Light Anti-armor Weapon (LAW), 35mm Sub-Caliber (M72-Series LAW)	H708	Rocket, 35mm, Practice (M73)	666 (203)[3]

Weapon/Caliber	DOD Identification Code (DODIC)	Ammunition Nomenclature	Minimum VDZ Height[5] Feet (Meters)
LAW, 66mm RKT HEAT (M72-Series LAW)	HX01	Launcher, Rocket, 66mm (M72 Series)	3116 (950)[3]
LAW, 84mm RKT HEAT (M136 [AT-4])	C995	Rocket, HE 84mm M136 AT-4 (M136)	3116 (950)[3]

[1] same as ball
[2] calculated plus 1.25 safety factor
[3] From DA PAM 385-63
[4] From SRTA ballistic graph - General Dynamics Ordinance
[5] Historical data based on 30° projectile trajectory plus safety factor

3-2.2 Access Restrictions, Warning Signs, Markers, and Flags.

Use service specific installation criteria.

3-2.3 Surface Danger Zones Over Navigable Water.

Use DA PAM 385-63/MCO 3570.1 when shooting over navigable water. A U.S. Army Corps of Engineers permit and citation in 33 CFR Part 334 are required.

3-2.4 Baffled Ranges.

When approved, overhead baffles can reduce the size of the SDZ but require special consideration that are not addressed in this UFC:

- Containment: Baffles designed to completely block line of sight out of the range may be used to eliminate direct fire from leaving the range but may not necessarily contain ricochets, ground skips, and splatter from leaving the range.
- Surface Danger Zone: The size and shape of the SDZ will need to be established on a case-by-case basis by the Government.
- Air movement: Baffles can significantly block natural air flow and increase potential for exposure to lead and other airborne contaminants. Unlike indoor ranges where negative pressure can be achieved, any ventilation system on baffled ranges will be influenced by outdoor air movement.

3-3 TYPES OF OUTDOOR RANGES.

Outdoor ranges may be configured in various ways to accomplish training goals.

3-3.1 Single Fixed Firing Line.

These ranges have one fixed firing line with targets placed along one or more target lines downrange. A moving target system may also be provided to vary target distance.

3-3.2 Multiple Firing Lines.

These ranges vary target distances using multiple firing lines used for shooting at one target line at the end of the range.

3-3.3 Maneuver Areas.

Maneuver ranges allow fire and movement in multiple directions. These ranges may or may not have permanent firing positions or firing trails. They may have single or multiple targets or target arrays. The complexity of maneuver ranges varies significantly. Simple maneuver ranges train movement and firing while moving techniques to individuals and teams. Complex maneuver ranges train movement, engagement, and support techniques to larger, or multiple, maneuver elements using a variety of weapons and weapon systems. Maneuver ranges often use Short Range Training Ammunition (SRTA), Standard Operating Procedures (SOPs) or Observer/Controllers to limit the firing locations and target engagement in order to limit SDZs.

3-3.4 Skeet and Trap Ranges.

Skeet and trap ranges are a type of outdoor recreational range that are typically limited to shot size Number 7.5 and smaller. Follow the United States Army Corps of Engineers (USACE) Centers of Standardization (CoS) Outdoor Sports Facility Standard.

3-4 SITING.

3-4.1 Mandatory Requirements and Issues to Address.

- The range must be accessible by road. Vehicle access is required to the range area for maintenance, grass mowing, emergencies, and delivery of weapons and ammunition.
- Travel distance to the range.
- Storm water management.
- Protection of wetlands, ground water, and surface water.
- Suitability of terrain.
- Historical and archaeological features.
- Previously contaminated sites, including unexploded ordnance contamination.
- Endangered species habitat.

3-4.2 Considerations.

When siting and orienting the range consider:

- Allowing for future expansion.
- Orienting north to south to minimize glare for the shooters.
- Orienting the firing away from sensitive and inhabited areas.
- Taking advantage of existing impact areas and natural backstops.
- Eliminating drainage structures on the range surface whenever possible.
- Using natural drainage with no flowing water courses near the range floor or impact berm.
- Avoiding areas that are subject to flooding.
- Minimizing noise to surrounding areas both on and off the installation. Noise models such as those provided in the Army's Range Management Toolkit (RMTK) may be used to develop potential noise contours.
- Taking advantage of any natural barriers and base restricted areas to prevent access by personnel and animals to the SDZ.
- Taking advantage of any natural topography such as hills and mountains to help contain rounds.
- Selecting site to minimize grading of range surface to produce a smooth surface of homogeneous material. A rocky surface will increase ricochets.
- For areas where wind predominantly blows in one direction, orienting with wind blowing downrange.
- Taking advantage of local topography to assist with runoff removal.
- In cold climates minimizing snow drifts and ice buildup and facilitating snow removal on range.

3-5 SUPPORT FACILITIES.

Supporting facilities include roads, drainage structures, and utilities. Design and locate these features to protect them from direct fire.

3-5.1 Roads and Parking.

Design for access by all vehicles that will use the range. Provide surfaced all-weather connector roads from the installation road network to the range complex. Provide range access roads that approach the range complex from behind the firing line and outside the SDZ.

3-5.2 Utilities.

3-5.2.1 Electricity.

Size service to accommodate power requirements for target systems, lighting, support facilities, and range maintenance.

3-5.2.2 Telephone and Radio Communication.

Include two forms of communication between the Range Control Facility, Range Safety Officer (RSO), instructors, beach guards, and any others involved in the operations of the range and security of the SDZ. For Army, follow DA PAM 385-63 and installation's SOPs.

3-5.2.3 Water.

Coordinate with the local utility and Designated Fire Protection Engineer (DFPE), as defined in UFC 3-600-01 to determine requirements. Consider fire protection, drinking, hand washing, and sanitary uses. If a water system is not feasible, consider a well and tank system. If this is not feasible, consider portable fire protection such as fire extinguishers or tanker trucks as required by the DFPE in collaboration with the installation fire department.

3-5.2.4 Restroom Facilities.

Restroom facilities are required adjacent to or within a reasonable distance from the range. Where sewage and running water are not feasible, other options such as composting or commercial portable latrines may be used.

3-6 GEOMETRY FOR NAVY AND AIR FORCE RANGES.

Typical geometry for a flat rectangular outdoor range may be adjusted when necessary to accommodate different types of training.

3-6.1 Measurement Control.

For vertical control define the firing line floor surface (FLFS) elevation as 0.00 and set other features based on this. Base horizontal control on measurements taken from the rearmost firing line (FL).

3-6.2 Target Centers.

Locate the center of the target at an elevation between the upper limit of fire (ULF) equal to 6 ft. (1.8 m) above FLFS for standing shooting and lower limit of fire (LLF) equal to 6 in. (152 mm) above FLFS for prone shooting.

3-6.3 Lanes.

Lane widths vary depending on weapons and training requirements. Establish lane width as necessary to safely support intended training.

3-6.4 Range Length.

Locate target lines as necessary to accommodate intended weapons and training.

3-7 GEOMETRY FOR ARMY RANGES.

Refer to TC 25-8 and the RDG for standard Army range layouts.

3-8 RANGE COMPONENTS.

Locate and design components to avoid direct fire and the creation of potential ricochet hazards.

3-8.1 Drainage.

Design positive grading to direct runoff away from the firing lines and prevent flooding at the target line(s) and access roads. Avoid using drainage structures on the range surface when possible. When the length of the slope or natural terrain require using drains between target lines and firing lines, trench drains or subsurface gravel drains should be located on the forward edge of the impact berm or bullet trap. Design inlets so that no hard-flat surface will be exposed to shooters and provide enough protection to account for heavy bullet impacts and erosion.

3-8.2 Floor Surface.

Design the surface to be smooth and graded to drain away from targets. Side to side grading should be minimal except on ranges where defilade or obstructions are desired for training. Transverse firing line grading should match target line transverse grading. Allow enough fore and aft distance to support the type of training conducted. Clearly mark firing lanes on the surface to match the targets. Depending on the number of personnel to be supported, the following surfaces may be considered at the firing line:

- Ground firmly compacted with mown grasses.
- Sand or fine gravel, with shooting mats for prone shooting.
- Wood decking of enough thickness and supporting members to avoid deck movement.
- Concrete pad topped with cushioning material.

3-8.3 Benches.

Continuous benches or individual trays may be provided to hold ammunition and weapons. Place trays to allow safe weapons handling.

3-8.4 Bleachers.

Bleachers and covered shelters may be provided outside the SDZ behind the firing line for training and briefings.

3-8.5 Obstacles.

Mock-up roofs, windows, doors, and other training structures may be provided at the firing line to meet training requirements.

3-8.6 Range Safety Officer Position.

Where possible, provide the Range Safety Officer (RSO) position an unrestricted view of all firing lines and target lines from their control position.

\1 When outdoor range temperatures exceed 86 F (30 C) implement occupational safety procedure identified within the heat injury prevention plan. These measures may include drink water supply, increased break time, cooled or shaded rest area, and heat stress monitoring. See your Service's occupational safety office for detailed guidance and monitor your local Heat Stress Flag Status.

Note: 86F (30 C) threshold is taken from NIOSH Figure 8-2 and falls within the Lower risk level (Table C-1) within NIOSH Occupational Exposure to Heat and Hot Environments publication. **/1/**

3-8.7 Towers.

Tower requirements are service and training dependent. Elevated range towers may be necessary to provide proper visibility for the RSO.

3-8.8 Overhead Cover.

Overhead cover may be provided but is not required nor recommended in most cases. While it can provide some protection from direct sun and the elements, covering the firing line can also increase noise levels below and interfere with air movement needed to remove airborne contaminants away from shooters. When provided, design to reduce noise reflected down to the firing line and to minimize interruption of natural air movement.

3-8.9 Lateral Limit Markers.

Lateral limit markers indicate direction of fire limitations from the outmost firing and target positions. The right lateral limit is found by taking the line of sight from the right firing position at the most uprange firing line to the right most target downrange, and similarly for the left. For Army ranges, TC 25-8 and the RDG along with installation SOPs define the type, size and location of limit markers.

3-9 IMPACT BERMS.

Impact berms are required for Navy and Air Force ranges that are generally flat, fire in one direction, and have target distances of 200 yds. (182 m) or less. Impact berms:

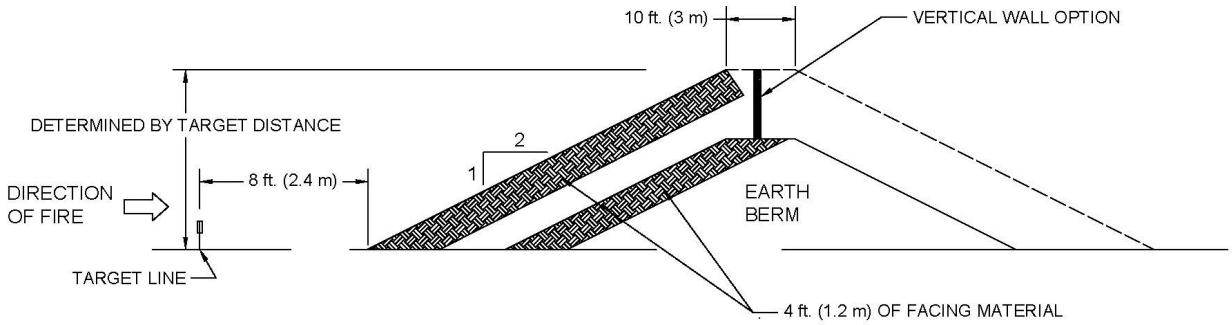
- Capture projectiles where they can be collected and removed more efficiently compared to ranges without impact berms.
- Significantly reduce the number of projectiles spreading out and landing downrange in the SDZ.
- Will not capture all projectiles because ground skips and ricochets will continue downrange.
- Will not reduce the length of the SDZ since the controlling round is at such an angle that its trajectory is well above the impact berm.

3-9.1 Geometry.

When required, design in accordance with Figure 3-1 and as follows:

- Slope: A slope of 2H:1V is recommended. A steeper slope of 1.5:1V may be used if a stable berm can be constructed that also allows future sifting of the soil.
- Width: Provide a total berm width equal to the firing line width plus the additional width necessary to cover a 5-degree dispersion angle from all firing positions.
- Top of Berm: Minimum 10 ft. (3 m) horizontal top on the berm.
- Toe of Berm: A minimum of 8 ft. (2.4 m) past the last target line.
- Minimum Height: 16 ft. (5 m) above the highest grade at the last downrange target line for ranges with target distances of 50 yd. (46 m) or less and 26 ft. (8 m) for ranges with target distances of 100 yd. (91 m) and greater. For ranges with target distances between 50 yd. (46 m) and 100 yd. (91 m), use a height that is prorated between the 50-yd. (46m) and 100-yd. (91 m) berm heights.
- Wall Option: A vertical wall may be provided on the top of the berm to reduce the berm height and footprint. The earth portion must be a minimum of 16 ft. (5 m). As a minimum, the wall should be solid 8 in. (203 mm) thick concrete. The foundation must have a minimum 4 ft. (1.2 m) of earth cover on shooting side of the berm. The direct line of fire from the prone position through the target point must impact the earth portion of the berm 3 ft. (1 m) below the exposed wall.
- See Butt Target Systems paragraphs for minimum berm height and toe of berm distance from target line when using that system.

Figure 3-1 Impact Berm



3-9.2 Berm Material.

Specify berm material in the design that will achieve and sustain a proper slope, promote vegetation growth, reduce the chance of ricochets, and allow for sifting to remove projectiles. Require the upper 4 ft. (1.2 m) of facing material on the impact side to be free from rocks and debris no greater than a No. 4 sieve – equivalent to 0.187 in. (4.76 mm) diameter mesh – that will not clog screens when sifting. A high clay content will help achieve a more stable slope, but too much clay in the upper layer will make it very difficult to sift and remove spent rounds in the future. Therefore, the facing material must not have more than 40% passing the No. 200 sieve.

3-9.3 Berm Construction.

Construct the berm in compacted horizontal lifts. Do not allow compaction up the slope of the berm face. Use benching and keying techniques to enhance slope stability when resurfacing or tying into an existing berm.

3-10 TARGET SYSTEMS.

The type of target system used will influence significant portions of the design. Choose systems based on the type of training anticipated. See individual service policy for procuring range target system equipment. A variety of target systems are available and new systems are under constant development. Current target systems include, but not limited to:

- Paper Targets on Wooden Frames: Paper targets can be mounted on simple wooden or other non-ricochet producing stands at the target line. They are typically used for 27.3 yd. (25 m) target distances or less because the time needed to walk downrange and score the targets.
- Butt Target Systems: Butt systems use paper targets secured to cardboard or plywood frames that are raised, lowered, and scored by personnel located downrange behind a protective berm. These systems are simple, reliable, and allow the shooter to remain at the firing line while

the targets are scored but are labor intensive because a downrange scorer is required for every shooter.

- LOMAH (Location of Miss And Hit) Targets: A computerized target system with sensors at the target end that detect the path of the projectile though the target and provide feedback to monitors at the firing line. These are generally very accurate but expensive and require significant maintenance to maintain calibration.
- Pop-Up Targets and Stationary Infantry Targets (SIT): These targets are raised and lowered remotely and can be either electric or pneumatic.
- Steel Targets and Knockdown Targets: Steel targets are typically used when accurate scoring within the target is not needed, only a hit or miss. Steel targets provide audible feedback and are designed to go down or spin when struck. Knockdown targets fall when struck. Knockdown targets can be steel but other versions are available. Steel targets and knockdown targets can be reset pneumatically, electrically, or by gravity. Check with service safety requirements when considering steel targets as they will impact target design, placement, and safe target distances.
- Turning Targets: These targets rotate on a vertical axis to present alternating target face and edge to initiate and cease firing. They can be designed with a friend face on one side and a foe on the back for shoot and no-shoot drills. Turning mechanism can be pneumatic or electric.
- Running Man and Moving Infantry Targets (MIT): Targets that move laterally or randomly on a track. Targets can present personnel and vehicle silhouette including armored vehicles and tanks. These targets are typically provided to supplement other target systems.
- Stationary and Moving Armor Targets: Targets that simulate a tank or other vehicle for live fire training and qualification programs.
- Mobile and Robotic Targets: A variety of targets are available that move on remote controlled vehicles.

NOTE: When using moving targets, it is critical to incorporate all shooting positions and angles when developing the SDZ.

3-10.1 Target Systems for Army Ranges.

For Army ranges, AR 350-19, TC 25-8, and the RDG define target types, control systems, interface, emplacements, protection, and procurement processes.

3-10.2 Target Line Grading and Protection.

Match grading at target line bases with firing lines when possible. Protect target support bases from direct fire by:

- Providing a target berm on the firing side.
- Burying below ground.
- Providing a protective wall designed to stop rounds but reduce ricochet potential.

3-10.3 Target Supports and Berms.

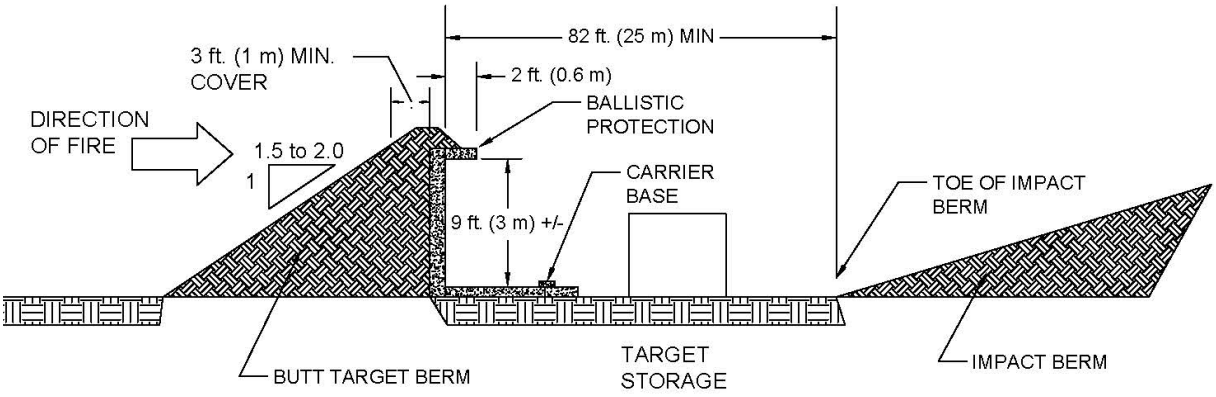
Target holders and bases should be designed to prevent ricochets and splatter. Earth berms can be placed in front of targets to protect target base and should be constructed from the same material as the impact berm.

3-10.4 Butt Target System.

Butt target systems allow manual scoring of targets by personnel downrange behind the target line and protected by a berm. Design in accordance with Figure 3-2 and as follows:

- Design butt target berm with a slope that is maintainable, typically 1.5 to 2.0H:1V and 3.0 to 4.0H:1V where erosion is a major issue.
- Provide an impact berm behind the target berm with a minimum height of 26 ft. (8 m) above the carrier base elevation.
- Toe of impact berm a minimum of 82 ft. (25 m) from the butt wall.
- A target storage facility protected from direct fire may be included between the butt system and the impact berm. Top of structure must be below all direct lines of fire and the top elevation of the ballistic protection in the pit.
- For Army Ranges, use the Known Distance (KD) Range section of TC 25-8 and the RDG for the design and construction details for this type of target system.
- For pit option, see the RDG.
- For USMC, meet the requirements of MCO 3570.1.

Figure 3-2 Butt Target System



3-11 PARALLEL RANGES.

When parallel ranges have SDZs that cover the firing line of the adjacent range, the ranges may be used concurrently when side containment is provided as follows:

- Earth Berm: Require an inside slope of 1V:1.5H or flatter with a minimum horizontal 6 ft. top width. Provide same material and compaction as required for impact berms.
- Concrete Wall: Require a minimum 8 in. (203 mm) thick concrete wall with a smooth, flat surface free of irregularities, form ties, and protrusions.
- Shock Absorbing Concrete (SACON): Design based on type of weapons and ammunition used.
- Wood and Gravel Walls: Timber and gravel filled wooden walls on new ranges are not recommended because of maintenance and integrity issues.
- Height: Require a minimum height of 10 ft. (3 m) above the highest elevation on either side where personnel could potentially be standing while either range is in use.
- Army ranges may require an SDZ deviation to allow concurrent use.

3-12 MACHINE GUN TUBE RANGE.

Training on machine guns up to 7.62 mm caliber may be provided using a 10-meter tube range. See Figures 3-3 and 3-4. These ranges incorporate range tubes that function as baffles to reduce the size and shape of the SDZ. Army ranges of this type require the same approval as other baffled ranges. Tube ranges are not suitable for:

- Machine guns over 7.62 mm caliber.

- Navy OPNAV 3591 machine gun training since they do not support the training requirements for traverse firing.

3-12.1 Surface Danger Zone.

The machine gun tube SDZ for all ammunition types less than 7.62 mm is 2296 ft (700 m) and the VDZ for all ammunition types less than 7.62 mm is 1640 ft (500 m). The reduction in the SDZ for 7.62 mm and greater ammunition will be determined by the Government. Army ranges require a deviation IAW AR 385-63.

3-12.2 Machine Gun Tubes.

For 10-meter machine gun tube ranges use concrete pipe with a minimum length of 24 ft. (7.3 m) and either round with a minimum 5 ft. (1.52 m) inside diameter or square with a minimum 5 ft. (1.52 m) inside dimension. Provide a reinforced concrete slab the length of the tubes to maintain joint integrity. The tubes may be constructed of sectional pieces if the spigot end of the bell spigot joint is pointed downrange. Tubes may be made of ASTM C75, Class V reinforced concrete pipe (RCP) requirements, or may be steel pipe of suitable thickness fabricated from rolled plates. The interior of the tubes must have a smooth continuous surface. Repair any lifting lugs or holes so the tube interior is smooth and does not produce erratic ricochets.

3-12.3 Drainage.

Slope the tubes approximately 6 in. (150 mm) towards the target line. Firing positions must be at least 12 ft. (3.7 m) apart, measured center-to-center. The end of the tube toward the shooter should touch the firing line.

3-12.4 Firing Platform.

Ensure that the firing tube placement and the firing platform height will place the muzzle of the machine gun at the approximate center of the tube height and at least 6 in. (150 mm) inside the tube. To achieve this, the platform may need to extend inside the tube approximately 3 in. (76 mm) depending on the tripod and weapon dimensions.

3-12.5 Berm Backstops.

For berm backstops, locate the berm no more than 150 ft. (45.7 m) from the firing line to the centerline of the berm. The minimum height of the backstop is established by determining where the highest point that a bullet could exit the target end of the tube and impact the berm. This line must intersect the berm no less than 6.5 ft. (2 m) from the top. Use same material as required for impact berms.

3-12.5.1 Optional Deflector Plate.

Locate the deflector plate at least 2 ft. (0.6 m) above the highest bullet impact point on the berm. The deflector plate may be either angled or vertical which will influence the reduction in the SDZ.

3-12.5.2 Optional Steel Traps.

Locate the trap at least 50 ft. (15m) away from the firing line. The line drawn from the firing point to the highest point that a bullet could exit the target end of the tube must intersect the top plate of the trap not less than 12 in. (300 mm) from the top, measured along the slope of the trap.

3-12.6 Noise.

Engineering solutions to reduce the noise levels from tube ranges are limited and may consist of sand bags along the bottom of the tube. Cement-based acoustical treatment may also be used. Additional sound attenuating materials can also be added to the interior surfaces of square tubes. Appropriate operational mitigation must be established to reduce the high impact noise exposure. For Air Force ranges, the impact of hazardous noise levels for tube ranges must be evaluated by the local Bioenvironmental Engineering (BE) and Civil Engineering (CE) offices.

Figure 3-3 Machine Gun 10-Meter Tube Range Layout

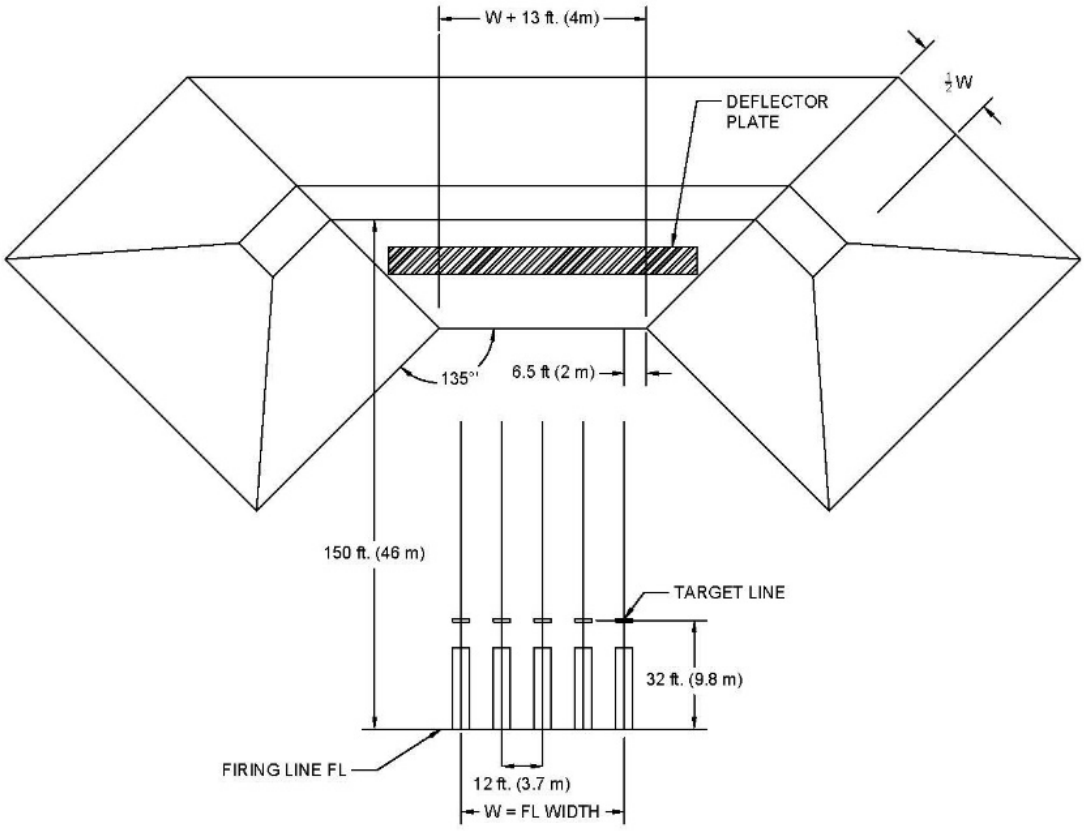
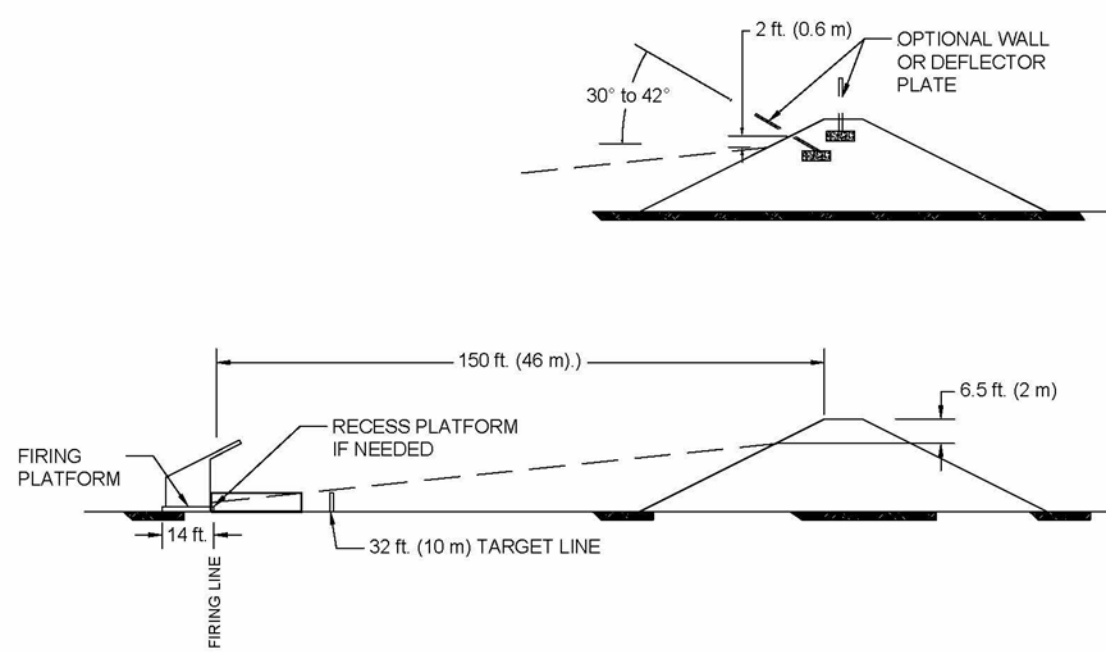


Figure 3-4 Machine Gun 10-Meter Tube Range Section



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CHAPTER 4 INDOOR RANGES

4-1 GENERAL.

Indoor ranges have open bays with shooting generally straight downrange into a bullet trap. Ballistic containment is provided by ballistic side walls, overhead baffles, and a bullet trap. Indoor ranges can be built using conventional or modular construction methods. A push-pull ventilation system supplies air from behind the firing line and exhausts at the trap end to move airborne contaminants downrange and away from personnel inside the range. Design and construct Army and Marine Corp indoor ranges IAW applicable portions of this UFC and the design and safety requirements found in DA Pam 385-63; the DA PAM controls in case of conflict.

4-1.1 Coverage.

The ballistic containment criteria in this chapter is intended for indoor ranges that support weapons and ammunition with energy up to 2,500 foot-pounds (3,390 Newton-meters) including handguns, 5.56 mm rifles, and 7.62 mm rifles. It does not support:

- Tracers, explosives or incendiary rounds.
- Armor Piercing (AP) rounds.
- 5.56 mm or 7.62 mm Enhanced Performance Rounds (EPR), (M855A1 or M80A1) **\1** may be used on granular rubber bullet trap or steel bullet traps upgraded and specifically certified by the manufacture for these more powerful EPRs. **/1/**

Design the range systems for the specific, worst-case rounds for these or other higher-powered weapons. The ballistic containment system includes baffles, floors, walls, splatter protection, and bullet trap.

4-1.2 Range Areas.

An indoor range facility can be divided into three functional areas:

- The training area between the rear uprange wall and the bullet trap where live fire occurs. The training area requires a ballistic envelope to contain rounds within the facility.
- The direct support area that includes the range safety officer’s office, entrance vestibules, storage areas immediately off the training area, and the area behind the bullet trap.
- The indirect support area and all other spaces including administrative, restrooms, classrooms, hallways, and other storage areas.

4-2 TRAINING AREA.

Define training requirements, ammunition, target distances, and maintenance issues prior to developing a floor plan. For ranges approaching 100 ft. (30.5 m) width and wider, the cost and size of structural components can increase significantly and should be taken into consideration when determining number of lanes and range width. Consider multiple bays to provide flexibility and reduce structural loads.

- Navy: The Navy standard qualification range has an 82 ft. (25 m) target distance with 4 ft. (1.2 m) lane widths. Note that while some Navy training only requires a 25-yard target distances, a 25-meter range provides additional capability and safety. For Naval Special Warfare indoor ranges, the layout is not standard and will vary depending on type of training supported.
- Air Force: Use Air Force Facility Criteria FC 4-179-03 for planning and layout of indoor ranges along with general requirements provided in Chapter 1. This Air Force FC provides general guidance on lanes and detailed planning requirements for the indirect support areas.
- USMC: Typical indoor ranges have either 82 ft. (25 m) or 164 ft. (50 m) target distances.
- Army: Base layout on training and installation specific requirements.

4-3 DIRECT SUPPORT AREA.

4-3.1 Range Control Booth.

4-3.1.1 Ventilation, Layout, and Sound Attenuation.

Include a ventilation system independent of the training area range ventilation system and a 2 ft. (0.8 m) wide, full-length work counter at the base of the window. Locate all range controls and utility panels in this area. Locate lighting and communications controls to allow adjustments while maintaining clear visibility downrange. Provide sound attenuation to allow personnel in the booth during live fire without the need of hearing protection as described by the noise paragraphs in this chapter.

4-3.1.2 Visibility.

Design range control booth to provide full line-of-sight visibility from a center seated position 4 ft. (1.2 m) behind a 4 ft. (1.2 m) high window to 4 ft. (1.2 m) behind the firing line on both sides and extending downrange to the target area. See Figure 4-1. Coordinate window level with that of the ventilation supply diffuser so the downrange view is not blocked by the diffuser when standing. Windows and doors within the booth must not restrict or distort the view downrange. Closed-circuit television monitors may be used to enhance, but will not replace, this requirement. Provide windows with views into the hallway behind and vestibules to the sides that allow monitoring of movement in and out of the training area. Use sliding closures or other method on the windows into

hallways and vestibules that can be used to completely block light from coming into the range control booth during low light conditions. For Air Force ranges, raise floor in booth a minimum 2 ft. (0.6 m) minimum above the range floor to promote visibility downrange and to all range entry points.

4-3.2 Airlock Vestibules.

Entrance vestibules with doors at either end are required to allow movement in and out of the range without disturbing the air balance of the range. A minimum of one vestibule for ranges with seven lanes or less, and two vestibules for ranges with more than seven lanes is required. Place vestibules adjacent to the Range Control Booth with windows to allow monitoring of movement from the booth. All doors into the training area must swing outward from range to help seal doors under negative pressure. Seal around doors and place sweeps at bottom to provide an airtight closure.

4-3.3 Vacuum Storage.

Include a storage area with direct access to the training area for portable High Efficiency Particulate Air (HEPA) vacuum and equipment storage.

4-3.4 Brass Storage.

A 55-gallon drum may be placed next to side wall behind firing line for brass storage immediately after collection.

4-4 TRAINING AND DIRECT SUPPORT AREA LAYOUT.

The width of the range is determined by the number of lanes, width of lanes, and the space provided against each side wall. The length of the range is determined by the distance behind the firing line, the target distance, the depth of the bullet trap, and the space behind the bullet trap. The height of the range is determined by the clear height between floor and bottom of the ceiling baffles, the ceiling baffle height, and the distance above the baffles needed for structural and mechanical systems. Make all surfaces downrange in direct line of fire non-reflective when lasers are allowed in training.

Use Figures 4-1, 4-2, and the following minimum distances:

- Range Control Booth: 10 ft. (3 m) front to back.
- Get Ready Area: Table 4-1.
- Target Distance: As required for training. Do not extend target system into the trap.
- Bullet trap: Approximately 27 ft. (8.2 m) – coordinate with trap manufacturer.
- Maintenance Area: Minimum 6 ft. (1.8 m) behind bullet trap. Verify there is enough space in maintenance area for all trap components,

compressors, and other hardware. This is area must not be used for storage.

- Clear Height: Table 4-1 for minimum distance. May need higher ceilings if vehicles are used in training.
- Distance between top of baffles and bottom of roof: As needed, including space for structural components and ventilation ductwork.
- Distance between edge lanes and side walls: Minimum 2 ft. (0.6 m). This distance is needed to help achieve proper airflow and prevent shooting near side walls.
- Lane Width: Minimum 4 ft. (1.2 m). Service and training requirements may dictate wider lanes.
- Avoid interior columns when possible. If provided, include a 2 ft. (0.6 m) buffer between column and lanes.
- Safety Ceiling: Extend ballistic coverage to 4 ft. (1.2 m) behind firing line.

Figure 4-1 Standard Range Layout

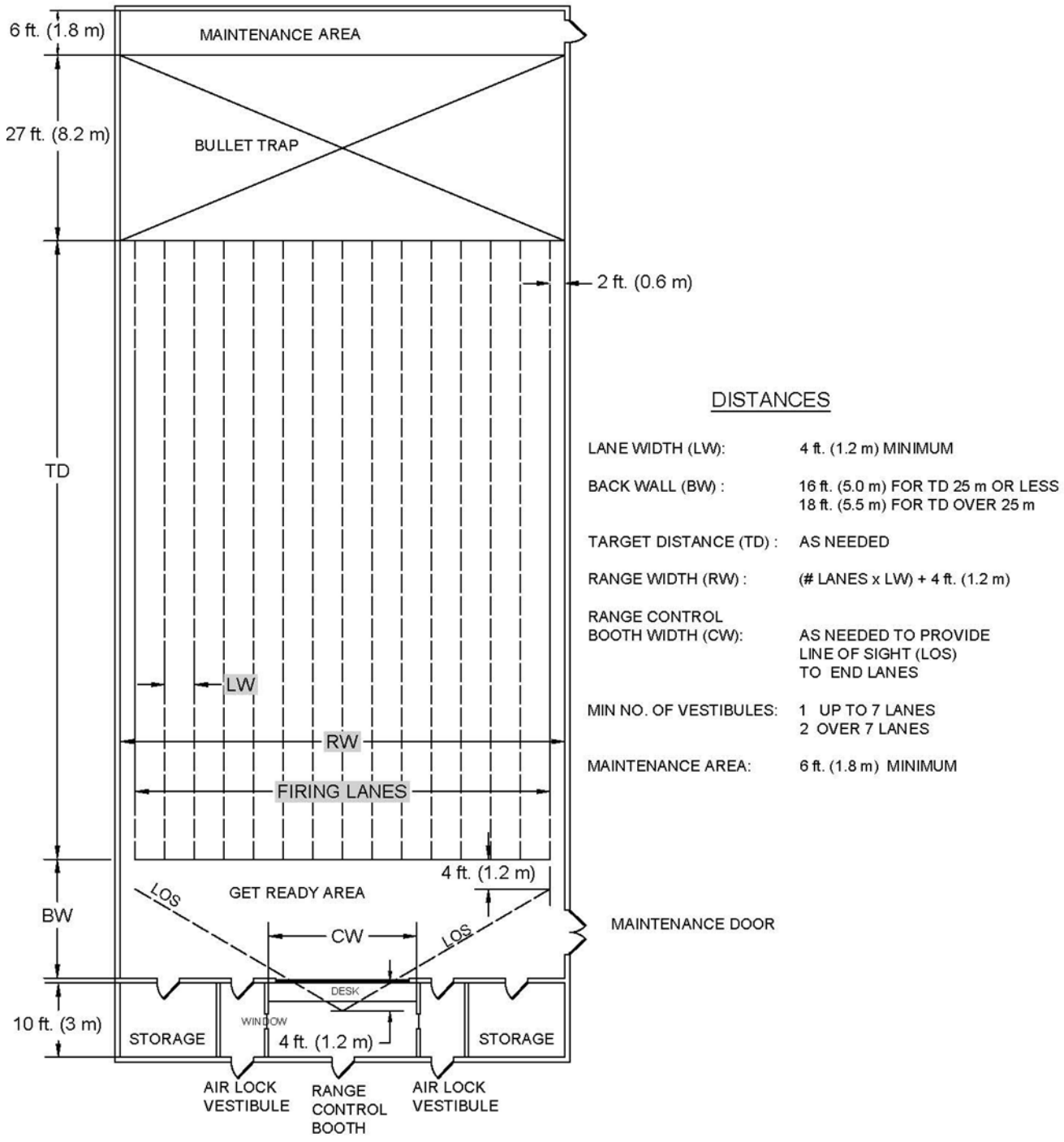
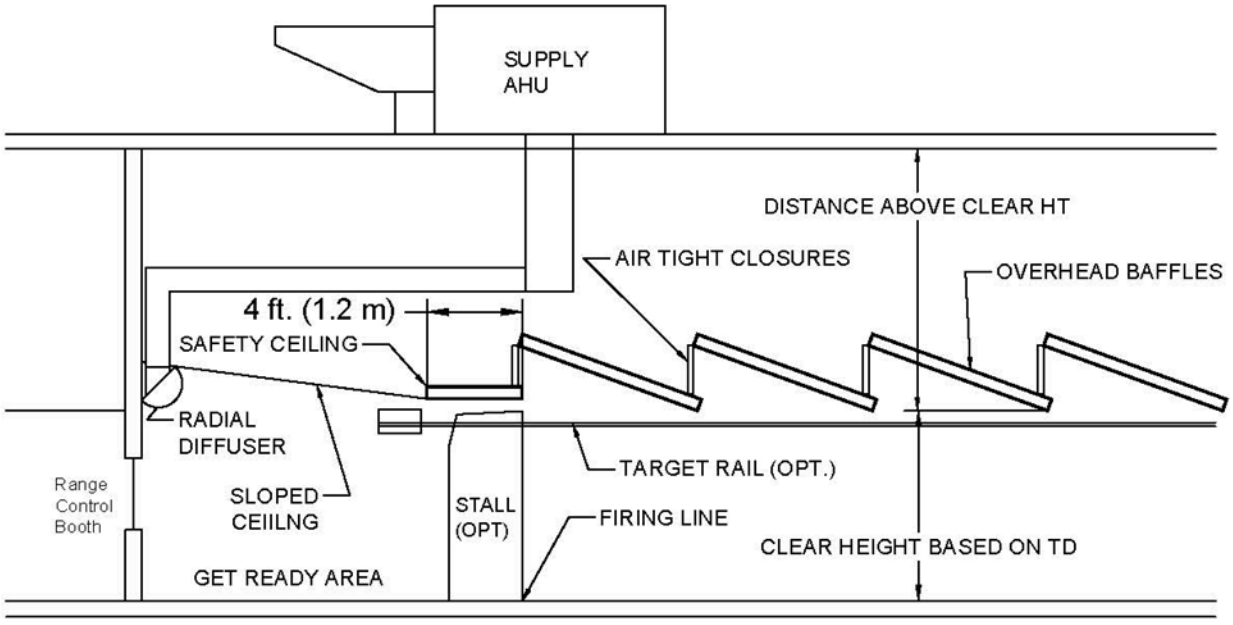
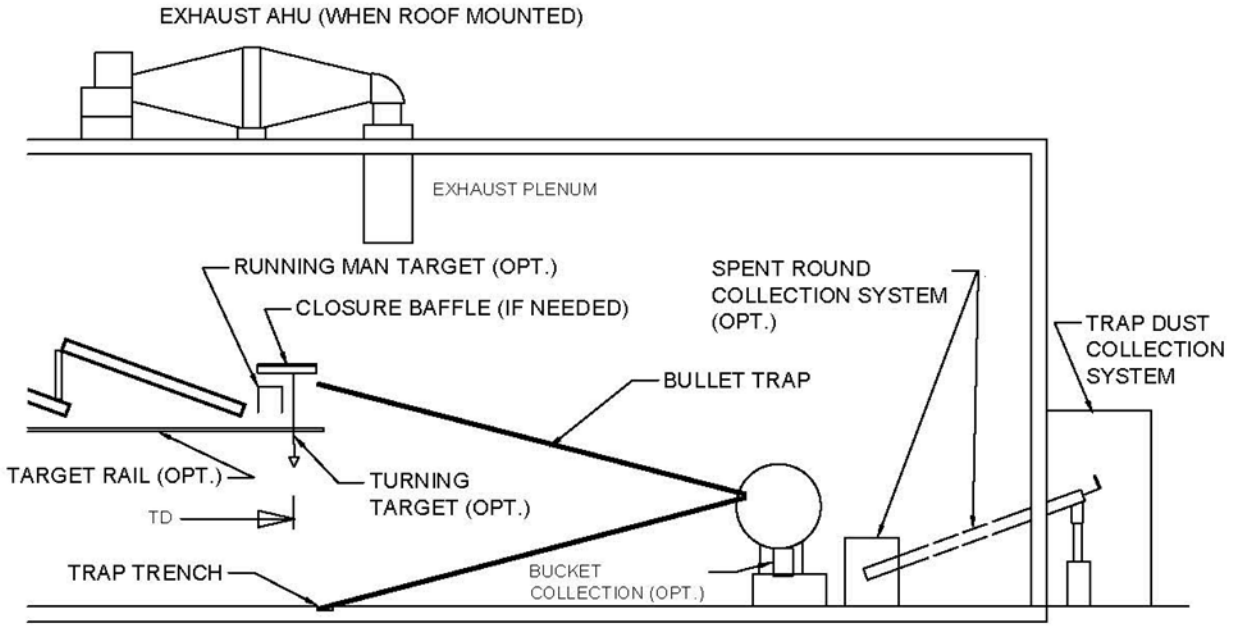


Figure 4-2 Standard Range Section.



UPRANGE



DOWNRANGE

Table 4-1 Range Heights and Get Ready Area Distances.

Target Distance (TD)	Clear Vertical Height	Get Ready Area (Backwall to FL)
Up to 82 ft. (25 m).	8 ft. (2.4 m)	16 ft. (5 m)
Over 82 ft. (25 m) up to 165 ft. (50 m).	10 ft. (3 m)	18 ft. (5.5 m)
From 165 ft. (50 m) to 328 ft. (100 m)	12 ft. (3.7 m)	18 ft. (5.5 m)

4-5 INDIRECT SUPPORT AREAS.

4-5.1 Required Indirect Support Area.

The following areas are required:

- Administrative Area: This area contains offices for the range safety officer, instructors, and maintenance personnel along with file and shelf storage for operations data and maintenance records.
- Restrooms, Shower, and Locker Room Areas: Size restrooms based on occupancy and range use. Size shower and locker based on range staff.
- Laundry: For range laundry use only.
- General Storage: Provide adequate storage for targets, filters, tools, and maintenance equipment.
- Maintenance and Storage area.

4-5.2 Other Indirect Support Areas.

The following areas may be necessary:

- Brass sorting: Include table with raised perimeter and holes to collection buckets or drums underneath.
- Classrooms: This includes space to conduct classroom training prior to live-fire and after-action debriefings.
- Weapons Cleaning Area: This space accommodates workbenches, degreasing tanks, and spray hoods. Exhaust hoods and vapor proof electrical fixtures may be required. Provide a lavatory with potable water and eyewash in the immediate area.
- Arms and Ammunition Storage: **\1** Comply with DODM5100.76, Physical Security of Sensitive Conventional Arms, Ammunition, & Explosives

(AA&E) and any Service supplements to this DoD manual and **/1/** UFC 4-215-01 Armories and Arms Rooms. When provided, include an issue and clearing area adjacent to the weapons storage and cleaning area.

- Break Room: Room for meals and breaks with space for refrigerator, sink, countertops, microwaves, coffee machines, table, and chairs. Provide signage that prohibits food inside the training area.
- Weapons Simulator Room: Design to accommodate anticipated system. These rooms may require raised flooring, compressor area, darkened or no windows, and a small control room. Signs must clearly mark room as simulation weapons only, with no lethal ammunition allowed.

4-6 FIRE PROTECTION.

The training area and trap area do not require a sprinkler system. Coordinate with the DFPE early in the design process for detailed requirements for the rest of the building. Provide 2-hour fire rated construction separating the training and direct support areas from indirect support areas.

4-7 COLLECTION, TEMPORARY STORAGE, AND DISPOSAL.

Design for the collection, storage, and disposal of:

- Brass, typically recycled.
- Supply filters, non-contaminated.
- Exhaust filters, contaminated after use.
- Filters from the dust collection system, contaminated after use.
- Dust captured in the dust collection system.
- Vacuum waste, contaminated.
- Trap collection waste, contaminated.
- Projectiles captured in trap collection system.

Note: Contaminate refers to material with lead, copper, and other compounds typically at levels that classify them as hazardous waste for storage and disposal purposes.

4-8 STANDARD INDOOR RANGE FEATURES.

Design a ballistically contained structure that:

- Contains all shots from each intended firing location, at all respective targets, for all weapons and calibers based on the intended training in the facility.

- Provides airtight connections between walls and roof to prevent air leakage into the range that can interfere with the ventilation system's negative pressure.
- Seals all utility connections leading into the range.
- Provides proper detailing and door hardware for an airtight closure.
- Provides a maintenance double door behind the firing line.
- Provides at least one maintenance double door in the area behind the bullet trap. Two double maintenance doors, one on each side, may be necessary to provide access to all heavy items and equipment.

4-9 MULTIPLE BAYS.

To increase flexibility and reduce spans, ranges may be divided into separate bays with structural walls extending the length of the range from floor to roof that prevent air movement between bays. Ranges that have a partial dividing wall or an interior row of columns are not multiple bay ranges. Design each bay to operate independently from adjacent bays with separate and independent:

- Ventilation systems and controls.
- Bullet traps and trap related equipment.
- Target systems.
- Range control booths.

4-10 CEILING, WALLS, AND DOORS.

Design walls to reduce noise transmission to adjacent occupied spaces and to withstand negative and positive pressures that would be encountered should the ventilation supply or exhaust fans fail. Walls must provide an airtight enclosure to maintain negative pressure inside the range as required for range ventilation. Seal any penetrations in wall including ductwork and utility penetrations.

4-10.1 Uprange Ceiling and Wall Behind Firing Line.

Slope suspended ceiling from back wall to edge of safety ceiling behind firing line to provide a gradual transition for supply air movement to firing line. Place removable suspended ceiling panels along the width of the back wall under ventilation balancing dampers for maintenance access.

4-10.2 Ballistic Side and Downrange Walls.

Make side walls and the downrange wall behind the bullet trap a minimum of:

- Concrete: 8 in. (203 mm) thick using either cast in place, tilt up, or precast construction. Structural design and internal thermal insulation may dictate

thicker walls. If internal cavity is provided, the interior section must meet the minimum thickness requirement. Walls must be smooth and flat with no protrusions, indentions, cavities, exposed steel, or any other feature presenting a ricochet hazard.

- Steel: Minimum 0.375 in. (9.5 mm) AR500 steel plate.
- Provide splatter protection on steel and concrete up to 8 ft. (2.4 m) above the floor and a minimum of 16.4 ft (5 m) down range of all firing positions, except do not place any splatter protection within 10 ft. (3 m) of the bullet trap. This is to allow inspection of the wall where it is most susceptible to bullet strikes.

4-10.3 Wall Joints.

Provide complete ballistic integrity across joints. For side walls, this includes joints from finished floor up to the highest point of the ceiling baffles. For the downrange wall behind bullet trap, this includes up to 12 ft. (3 m) above finished floor. Ballistic integrity can be accomplished using keyed construction joints or by placing 0.375 in. (9.53 mm) thick AR500 steel plate over the joint. When used, design plate to protect the joint and reduce chance of ricochets by:

- Flush mounting plate to wall.
- Placing a 45-degree bevel on the leading edge of the plate that faces the shooter, with the plate fitted securely to the wall with no gaps over 0.0625 in. (1.6 mm) between plate and wall.

4-10.4 Downrange Doors.

Avoid doors between the firing line and bullet trap, but they may be necessary on large ranges to meet Fire and Safety codes. When placed downrange past the firing line, doors and door hardware must meet UL 752 Level 8 protection standard. This includes doors on back wall behind the trap so that rounds cannot escape during a trap failure. Doors behind the bullet trap that are located on the side walls are not required to meet this UL level. Use locking hardware, panic hardware, or magnetic door locks to ensure personnel do not inadvertently enter during live fire events. For doors on the side wall between the firing line and bullet trap, a wall baffle must be placed just uprange of door extending from the floor to the height of the door to reduce the chance of an errant shot striking the door hardware.

4-10.5 Maintenance and Vehicle Entrance.

For each bay, include a 6 ft. (1.8 m) wide maintenance double door uprange at least 4 ft. (1.2 m) behind the firing line. A larger door may be required if vehicles will be used in training. These doors are not operated during training and therefore do not require a double airlock vestibule.

4-11 FLOORS.

Concrete floors must be level with a smooth finish, without any protrusions or irregularities.

- Seal all floor joints and design to minimize ricochet potential.
- Locate longitudinal floor joints between firing lanes. Provide backer material when necessary to support sealant.
- Sawed control joints more than 0.25 in (6.3 mm) wide are not permitted.
- Traditional chamfered construction joints are not permitted.
- Surface seal floor with a waterproof sealant to facilitate cleaning.
- Use non-reflective flat or flat satin sealant when range is designed to allow lasers.

Steel floors may be 0.375 in. (9.5 mm) AR500 steel plate with support to prevent sagging.

- Provide a slip-proof coating.
- Do not apply any surface on the flooring that prevents the bullets from reaching the bullet trap or that will entrap firing residue and hinder the cleaning of the range floor.

4-12 RANGE MARKINGS.

Provide permanent range markings as required by the service. Use nonreflective paint when designing for laser use. The following are recommended:

- 4 in. (100 mm) wide red floor stripe across the width of rear uprange firing line.
- 4 in. (100 mm) wide black stripe across the width of the range in front of the trap at the last target line.
- 4 in. (100 mm) wide vertical black stripes up both side walls with critical target distances starting at the floor and extending 4 ft. up the wall. Provide 4 in. (100 mm) letters above this line indicating distance with units in either yards or meters depending on training requirements. For ranges with fixed firing lines and movable targets, the distances must be measured starting at the firing line. For ranges with a fixed target line at the trap end, the distances must be measured from the target line back towards the firing lines.

- Lane markings at the firing line and the last target line are to be coordinated with users on size and type of markings. For Air Force projects see Chapter 2.
- 4 in. (100 mm) wide yellow ready line 8 ft. (2.4 m) behind the firing line.

4-13 TARGET SYSTEMS.

Choose target systems based on the type of training anticipated and scoring accuracy required. The type of target system used will influence the floor plan, baffle design, and range height and must be considered in the design. Polices for procuring range target system equipment vary between services. All target systems must be designed to prevent ricochets and splatter from returning to shooters, with steel and other hard material angled and no blunt edges presented to the firing line. A variety of systems are available. Some options are presented below.

4-13.1 Static Target Stands.

Basic target stands allow for manual placement of target. Stands may be of wood, poly synthetic, steel angled away from line of fire, or other material designed to reduce ricochets.

4-13.2 Overhead Target Rail System.

Overhead monorail target systems have:

- Rigid overhead rails.
- Capability of 180-degree turning targets.
- Capability of moving and stopping target at all target distances.
- AR500 angled steel plate on front of carrier, target clamps, and connections between clamp and carrier designed for anticipated weapons and ammunition.
- Target rails approximately 7.5 ft. (2.3 m) above the finished floor.
- Ability to control single targets from individual lanes.
- Ability to control both single targets individually and all targets collectively from controls in the range control booth.
- Programmable target positions in both yards and meters.
- Programmable parameters including positions, start/stop times, and edge face targets.
- Drive system located behind the firing line using a cable system for moving targets.

Optional:

- Dimmable light illuminating target on target carrier.
- 360-degree target turning.
- Self-driven target carriers with internal motors and drive system.

4-13.3 Running Man Targets.

Running man targets are typically mounted on overhead rails that move targets left and right across the width of the range near the last target line. Running man targets can be either a single target system or a double system that runs two targets in opposite directions at the same time. Coordinate rail location with bullet trap, overhead baffles, other target systems.

4-13.4 Fixed Turning Targets System.

Turning targets are located at the trap end and have a target clamp on a vertical pivoting rod to rotate targets between face and edge. Clamps must hold targets securely but allow one-handed placement and removal of targets. The target clamp and vertical rods should be protected by 0.375 in. (9.5 mm) AR500 steel plate placed at an angle to extend life and help prevent ricochets. The unprotected components of the system must be placed behind overhead baffles to block line of sight from all shooting positions.

4-14 SHOOTING STALLS.

Shooting stalls may be used to provide shooting barriers, separate shooters, mount target controls, block ejecting brass from adjacent lanes, and limit ability of shooters to accidentally shoot sideways. Fold down or swing out tables and barricades may be included. Check individual service policy for requirements.

4-15 BARRIERS AND BARRICADES.

Training may require barriers or barricades and must be addressed in the design. Include storage space when they are not permanently affixed to the building. These may be portable wooden frames or features incorporated into shooting stalls. Other options include swing out barriers that fold flat to a side wall and barriers that can be temporarily attached to the wall and removed for storage when not in use. Check individual service policy for requirements and procurement policy. The following provides geometry for some service specific barrier and barricade requirements:

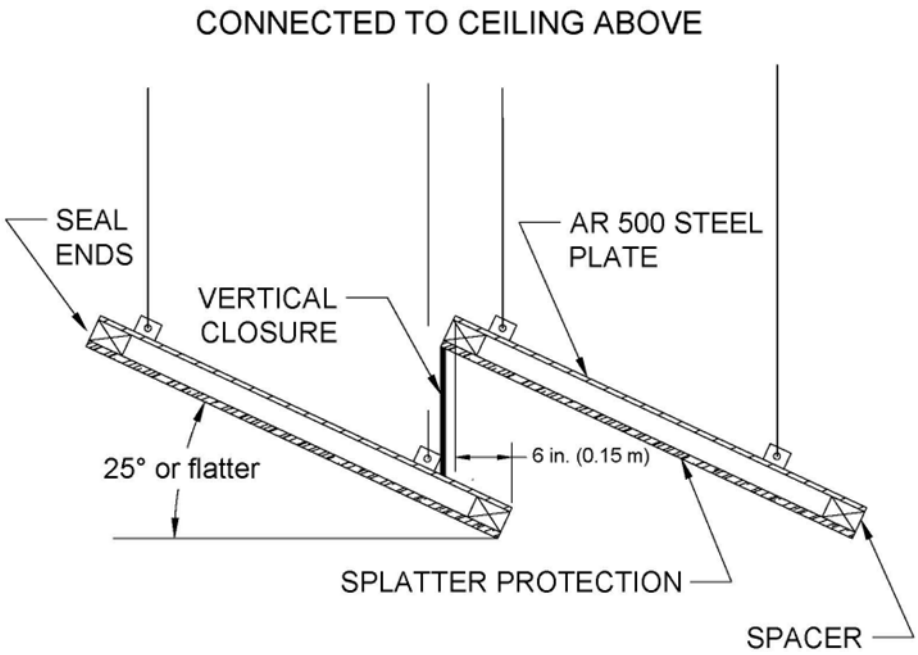
- Air Force: Position barricades as described in Chapter 2.
- Navy: Standing, low, and window barriers for Practical Weapons Courses in OPNAV 3591.

4-16 OVERHEAD BAFFLES AND SAFETY CEILING.

Design baffle system to provide complete overhead containment within the training area in accordance with Figure 4-3 and the following:

- Minimum 0.375 in. (9.5 mm) AR500 steel plate.
- Maximum 25-degree angle from horizontal.
- Minimum 6 in. (0.15 m) horizontal steel-steel overlap between adjacent baffles.
- Maximum 0.0625 in. (1.6 mm) mm) gap between steel plates for butt joints and 0.125 in (3.2 mm) where backing plate or lap joint is used.
- Non-ballistic vertical closure sections from the lower end of one baffle to the upper end of the next baffle downrange to prevent air from moving between open area below to space above baffles.
- Complete coverage from side to side with no gaps. This can be accomplished by using an AR500 plate connected to the side wall that overlaps with the overhead baffles.
- Provide intermediate support to prevent steel plates from sagging.
- Sealed off baffle section between steel plate and splatter protection to prevent the creation of a plenum that would allow air to move between training area below and ceiling space above. Spacers may be run in either direction provided ends are sealed between steel plates and splatter protection.
- Splatter protection provided on all baffle surfaces a minimum of 16.4 ft (5 m) down range of all firing positions.
- A closure baffle as shown on the downrange section in Figure 4-2 above may be required to complete ballistic protection when a running man target system is used.

Figure 4-3 Overhead Baffles



4-17 BULLET TRAPS.

Unless directed otherwise, all new indoor bullet traps must **\1** employ a commercial steel or granular rubber media **/1/** trap. Design the trap for the most powerful round to be used.

\1 A life cycle cost analysis of commonly manufactured bullet trap systems was commissioned by the AF and concluded in 2024. The analysis considered various factors such as installation cost, maintenance cost, benefits related to health, safety, and environmental stewardship, as well as other operational considerations over a projected 25-year period of analysis. The life cycle cost of a granular rubber bullet trap was found to be less than the cost of a steel bullet trap for most applications. The analysis was based on a loading rate of 55,000 rounds per year per lane, but also looked at the effect of fewer or more rounds. The life cycle cost of the steel and rubber traps equalized at approximately 136,000 rounds per year per lane. Above 136,000 rounds the steel trap begins to become a more cost-effective option. Although each bullet trap type depreciates over time, the granular rubber bullet trap system is the most economically viable bullet trap for many situations.
Compared to steel bullet traps, granular rubber traps:

- Take up less space.
- Cost less.
- Capture rounds more intact and thus reduce lead dust at the trap end.
- Can provide some limited reduction in sound reverberation time.

- Eliminates the impact noise of bullet impact against steel plates.
- Rubber traps require range to be shut down during bullet mining procedure whereas steel trap have integral bullet collection systems.
- Require more routine maintenance.
- Will fail if rubber levels are not maintained properly.
- Can ignite if not used and maintained properly.

NOTE: Rubber trap fires have caused significant damage on several DoD indoor ranges, mostly from lack of maintenance and the use of tracers ammunition, which should never be allowed within indoor ranges. Include the reapplication of fire retardant periodically during routine trap mining procedures.

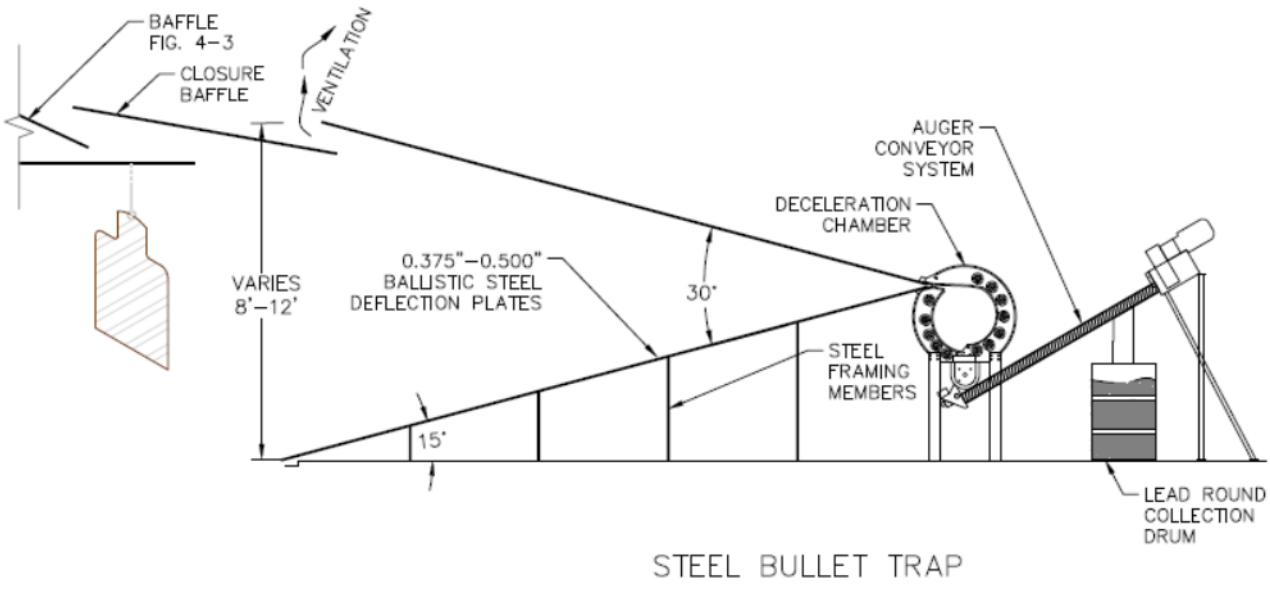
4-17.1 Steel Bullet Trap.

4-17.1.1 Steel Bullet Trap Requirements.

Steel traps must have:

- Minimum 0.375 in. (9.5 mm) thick AR500 ballistic steel plate tested in accordance with ASTM E10-08, meeting MIL-A-46100, and certified as having a minimum Brinell Hardness of 470. Required for all trap components that may be impacted by bullets. A thickness of 0.5 in. (12.7 mm) is recommended to increase the life of the plates.
- Capability to replace individual plates as they become worn or warped. All plates will eventually wear and warp depending on weapons, ammunition, and usage.
- Maximum lower ramp slope of 15 degrees off horizontal.
- Maximum slope of 15 degrees off horizontal for upper ramp plates immediately above the deceleration chamber. The upper ramp is typically hung from the roof.
- Continuous throat across the width of the trap with no vertical connector sections such that a rod placed inside the slot can move unimpeded across the width of the trap.
- Dust collection system to reduce dust at the trap end of the range. Provide forklift access to the dust collection drums.
- Spent round collection system. Provide forklift access to collection drums.

Figure 4-4 Steel Bullet Trap



4-17.1.2 Cantilevered Upper Ramp Support.

On existing ranges where a steel trap is being added, verify the roof can handle the additional load. Where the additional load of the trap cannot be supported, a structural cantilevered arm mounted to the floor behind the trap may be used. The cantilever option reduces roof load but takes up more floor space and increases cost. Account for the extra space required when using a cantilevered arm mount.

4-17.1.3 Dust Collection System.

The trap must include a system to capture and collect airborne contaminants at the deceleration chamber that provides:

- Noise levels below 80 dB when measured 10 ft. (1.2 m) from the system.
- Fans and filters located outside on back or side wall of range.
- Monitoring from within range control booth with indicators that show when system is running, filter status, and when dust collection drums are full.
- The ability to turn system on and off from within range control booth.
- A minimum volumetric flow of 500 cfm (14 m3/min) for every 10 ft. (3 m) of trap.
- Sealed ductwork that prevents the escape of dust.
- HEPA filters on the exhaust.

4-17.1.4 Spent Round Collection System.

Choose either a simple bucket system or mechanical system:

4-17.1.4.1 Bucket System.

Bullets fall from the deceleration chamber into buckets underneath. System must be sealed to contain lead dust and allow for easy removal and replacement with no special tools.

4-17.1.4.2 Mechanical System.

These increase complexity and cost over the bucket system but reduce the labor involved in collecting projectiles. These can be either:

- Auger Bullet Collection Unit: Spent rounds fall from the deceleration chamber into a sealed trough below. An auger pushes the bullets and fragments to one side of the room where another perpendicular inclined auger raises and drops them into a collection drum below.
- Drag Conveyor: Same as auger system except a conveyor belt is used to move spend rounds and fragments to the collection drum.

Include capability to monitor status of mechanical system and to turn system on and off from within the range control booth.

4-17.2 Granular Rubber Bullet Trap.

Do not reduce the range length when a rubber trap is chosen since it will eliminate the option of replacing the rubber trap with a steel trap in the future. Coordinate baffle and trap layout so that any round fired from any firing position will contact either 4 ft. (1.2 m) of rubber or an overhead steel baffle. As with a steel trap the overhead baffles must extend all the way into the trap to prevent any high angle ricochet from bypassing the overhead baffles of the trap backing. Design the trap frame to hold the weight of the trap, rubber, and 120,000 7.62 mm projectiles for every 4 ft. (1.2 m) of trap across the width of the range.

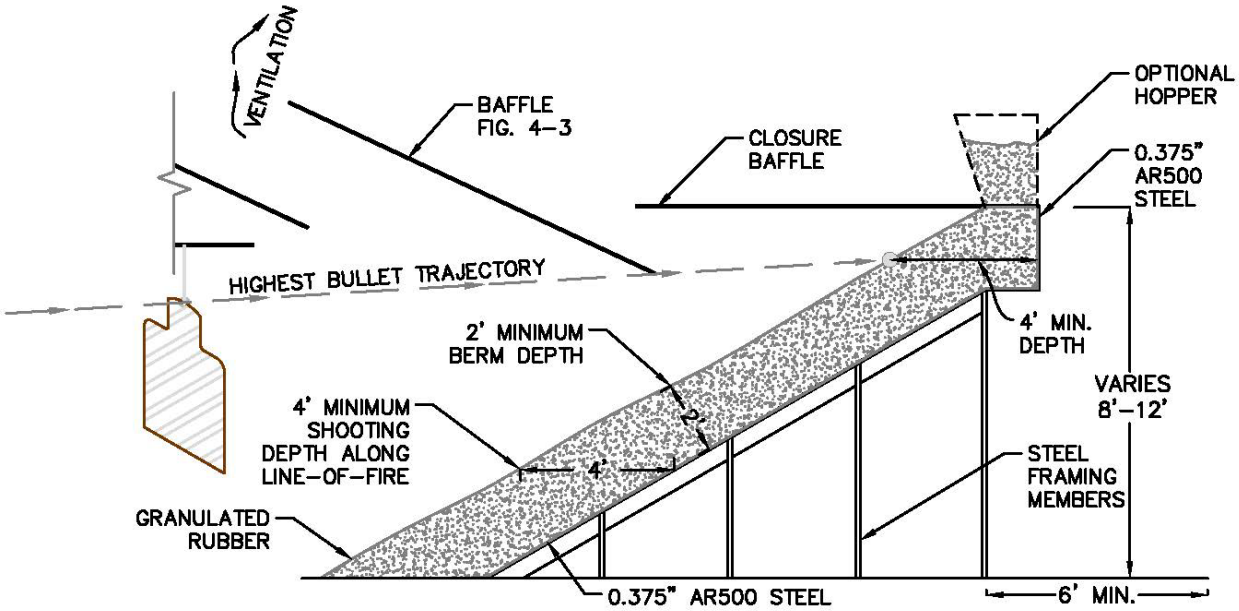
4-17.2.1 Design.

Design the trap to reduce the amount of rubber that spills onto the floor and include:

- Shredded rubber material with average diameter of 0.375 in. (9.6 mm) to 0.875 in. (22 mm).
- Clean chopped rubber that is 99.9 percent free of loose wire or exposed steel, by weight.
- Fire retardant and adhesion promotion treatment.

- Minimum 2 ft. (0.60 m) of rubber as measured perpendicular to the sloping face and a minimum of 4 ft. (1.20 m) of rubber measured horizontally, whichever is greatest.
- Trap base plate must be a minimum or .375 in (9.6 mm) AR500 steel plate.
- Plenum and roof vents above the trap area to collect and release dust, smoke, ammunition residue, and other contaminants.
- Coordinate with the local fire authority for design requirements that help contain smoke in the event of a fire including
- Vertical smoke barrier above the ceiling baffles across the width of the range towards the trap end to limit the movement of smoke up range.
- Fire protection plan showing recommended access to trap in the event of a fire.

Figure 4-5 Granular Rubber Bullet Trap



/1/

4-18 COMMUNICATIONS.

Include a loud speaker system between range control booth and range with volume control and capable of producing 110 dBA at the firing line. Locate as to not interfere with supply air flow. Include wall mounted handheld microphones for communication back to the range control booth, with one on each side wall and one on back wall below the range control booth window.

4-19 LIGHTING.

Design lighting system to reduce glare and provide independent lighting zones in accordance with Table 4-2 and:

- Locate downrange lights out of the line of fire. This can be accomplished by placing them behind the vertical section of the overhead baffles.
- Size and locate light and fixtures behind the firing line so they do not interfere with the supply airflow.
- Provide fully dimmable areas with flicker free lighting from 0 to 100 percent intensity levels.
- Locate lighting controls in the range control booth to allow adjustments with clear view of training area. Label controls to allow intuitive operation so that an operator unfamiliar with the system will be able to select and manipulate the controls accurately without any instructions.
- On ranges where training will occur using Night Observation Devices (NODs), all lighting, including emergency lighting, must be able to be turned completely off. Red lighting may be added downrange to assist visibility during low light training.

Table 4-2 Lighting Requirements

LOCATION	**FT CANDLES	TYPE
Range Control Booth.	60	Fully dimmable + dimmable red light.
Vestibules.	40	On/Off with switches in vestibule + range control booth.
Get Ready Area and Uprange Firing Line.	60	Fully dimmable + dimmable red light.
Target Area.	80	Fully dimmable.
Last Target Line.	100	Fully dimmable.
Area Behind Trap.	40	On/off.

** Measured at 4 ft. (1.2 m) above the floor.

4-19.1 Range In Use Lights.

Include a red Range In Use light above and outside vestibule entrances that indicate when range is in use. Light is on when range is operational. Locate switch in range control booth.

4-19.2 Security Training Lights.

Optional flashing lights may be required behind or above the firing line to simulate the flashing lights from security vehicles. Choose location to provide desired effect downrange while minimizing impact on ventilation air movement. Check with local security force for proper color and flashing effects.

4-19.3 Emergency Lighting.

For exit lighting, provide low profile lights oriented with smallest profile pointing downrange to minimize interruption of supply airflow.

4-20 NOISE.

Design range to meet:

- The maximum ambient and live fire noise levels in Table 4-3.
- Reverberation Time 60dB (RT60) less than 1.3 seconds as described in the sound decay rate testing paragraph below.

4-20.1 Noise to Adjacent Land.

Consider all notable sources of noise associated with the training facility when determining its layout. Noise transmitted outside of indoor ranges can be significant and depends on several factors including weapons and ammunition, thickness and material of walls and roof, roof to wall connections, and direction of fire. Air handling and dust collection systems can also produce significant noise. Noise transmitted outside of indoor ranges can be reduced through a combination of strategic layout, acoustic dampening characteristics of construction materials, and construction methods. The location of the range and the adjoining land use will determine the acceptable level of noise transmitted outside of the range.

4-20.2 Noise Inside the Training Area.

The training area design must incorporate acoustic control elements to reduce internal ambient noise levels and reverberation time. To meet these levels, the acoustic design should incorporate strategic layout, construction materials with acoustic dampening characteristics, and intentional construction method types. The seals on doors and windows should be tight to minimize the direct transmission of noise out of the firing range and into other interior rooms or occupied spaces of the facility. Absorptive acoustical surfacing will reduce the noise level in the range. Ambient noise does not

include the impulse noise generated by gunfire but does include other noise sources such as air handling and dust collection systems. Ambient noise levels are generally controlled by preventing the noise from reaching the occupied spaces. Some noise sources can be isolated from the occupied spaces. Walls with designated Sound Transmission Class (STC) ratings can also be used to separate noise generating equipment from occupied spaces. Extending partitions to the ceiling or roof level and sealing air gaps will reduce noise transmission.

Short duration impulse noise peaks created by gunfire will exceed the 85 dBA level and could exceed 160 dBA. Reflective surfaces in a range will reverberate noise during firing, extending the decay time of the noise.

4-20.3 Acoustical Treatment Locations.

Acoustic absorbing materials may be used behind the firing line and on the wall, ceiling, and ceiling baffle surfaces extending down range. Treat the ceiling baffle nearest to the firing line with acoustic absorbing materials as it is the most important ceiling baffle regarding noise levels behind the firing line. Floor areas of the range must remain bare concrete or steel. The floor behind the firing line may be covered with rubber or other acoustic mitigating materials so long as the materials are suitable for floor application and do not impede the removal of ammunition residue. Include the acoustic design calculations in the design analysis.

4-20.4 Acoustic Panels.

Acoustic panels may be installed on walls, ceilings, and baffles. Blown-on acoustic material and carpeting are not permitted due to the difficulty of cleaning accumulated ammunition residue. Acoustic materials must be nonflammable and not impede the vacuum removal of ammunition residue. Do not paint acoustic tiles or surfaces as paint significantly degrades the sound absorbing qualities of the acoustic surfaces. Acoustic panels often serve dual purpose to mitigate sound and provide bullet splatter protection.

4-20.5 Acceptance Testing.

For all new, addition, and modification projects that include modifications to the sound-absorbing materials within the range, acceptance testing must be performed by an independent acoustic specialist whose firm is a member of the National Council of Acoustic Consultants.

4-20.5.1 Sound Decay Rate Testing.

The acoustic design must include mitigation methods and construction materials to reduce the measured Reverberation Time 60dB (RT60) to less than 1.3 seconds in the 250 Hz, 500 Hz, 1 kHz, 2 kHz, and 4 kHz octave bands in accordance with ASTM E2235. Testing must be performed in accordance with ASTM E2235 with noise generating devices placed at the firing line. Aim device parallel with the line of fire when not using omni-directional devices. The contractor must provide certified test results showing that the reverberation time requirements are met.

4-20.5.2 Ambient and Live Fire Noise Level Testing.

The contractor must provide certified test results showing that the ambient and live fire noise levels within the range do not exceed levels shown in Table 4-3.

- All Ambient and peak noise level measurements must be taken with all range equipment on, including the air handling and dust collection systems, and no gun fire.
- All live fire noise levels must be taken with all range equipment on and with continuous gunfire from four Government provided shooters firing the maximum caliber design weapon, at full automatic if applicable, and using ball ammunition. Firing must be from the most uprange firing line without using suppressors.

Table 4-3 Maximum Noise Levels

	Maximum Ambient Noise Levels (dBA)	Maximum Live Fire Noise Levels (dBA)
Inside the Firing Range	75	Sound Decay Rate Test
Inside the Range Control Booth	60	85
Offices	45	55
Classrooms	45	55

4-21 RANGE VENTILATION.

In order to provide safe training and working environment, the ventilation system must limit exposure to airborne lead, copper, and other contaminants generated during small arms training. To achieve good air flow across the entire firing line, compliance with the following paragraphs is required. A recommended contracting strategy to help achieve these stringent requirements is provided in Appendix B.

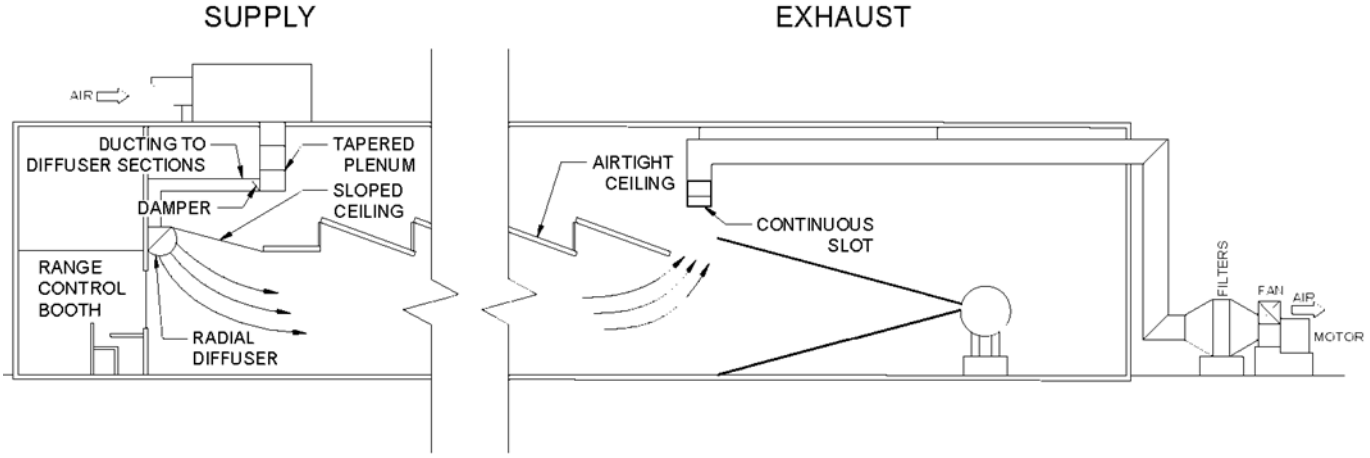
4-21.1 General Ventilation Requirements.

All ventilation system controls must meet the cyber-security requirements found in UFC 4-010-06. The training area ventilation system must be separate and independent from the support and administrative area ventilation system. Design the training-area ventilation system to meet the following:

- An air flow of 75 fpm (23 m/min.) at the firing lines meeting the acceptance standards included later in this section.

- 100 percent outside air with no recirculation.
- A negative pressure inside the range of -0.05 +/- .02 in (1.3 mm +/- 0.5 mm) of water column relative to the non-training areas in the range.
- Paired supply and exhaust units with each exhaust fan interlocked with one corresponding supply fan.
- The preferred location of the supply Air Handling Units (AHUs) is on the roof to reduce the amount of turbulence in the air before it reaches the supply plenums.
- The preferred location of the exhaust AHUs is on the ground to simplify filter changes.
- AHU motors limited to 75 horsepower or less.
- Variable Frequency Drives (VFDs) on all supply and exhaust AHU motors.
- Supply intake vents separated from exhaust outlets by a minimum 30 ft. (9 m).
- Location of exhaust ductwork coordinated with baffle and trap design to protect against direct hit and ricochets.
- Independent local control. Base-wide control systems may connect to the system for monitoring purposes but must not control or alter the system settings.
- Ductwork protection for all ranges within approximately one mile (1.6 km) of salt water bodies. Include a sprayed-on weather and corrosion resistant coating, such as the polyurea coating used to line truck beds, for all ventilation ductwork exposed to the environment. Consider for all other locations where corrosion is a problem. Choose material and thickness based on local conditions and ductwork material.
- See Figure 4-6 for a schematic range ventilation system.

Figure 4-6 Range Ventilation Schematic



4-21.2 Climate Control.

4-21.2.1 Heating.

Provide heat **\1** only in locations where the official DoD engineering weather data (UFC 3-400-02) 99% wet bulb temperature is below **/1/** 50 degrees F (10 degrees C). Specify design heating temperature and heating type. Chose a dry bulb discharge temperature between 65 and 70 degrees F (18 and 21 degrees C) that minimizes temperature differentials between winter and summer temperatures inside the range. Air-to-air heat exchangers may be included in cold climates when cost savings are supported by life cycle analysis.

4-21.2.2 Cooling.

Provide cooling only **\1** in locations where the official DoD engineering weather data (UFC 3-400-02) 1% wet bulb temperature is over 100 degrees F (37.8 degrees C). **/1/** Evaporative cooling may be considered if reduced temperatures do not drive humidity over 65 percent.

\1 When internal range temperatures exceed 86 F (30 C) implement occupational safety procedure identified within the heat injury prevention plan. These measures may include drink water supply, increased break time, cooling/rest area, and heat stress monitoring. See your Service's occupational safety office for detailed guidance and monitor your local Heat Stress Flag Status.

Note: 86F (30 C) threshold is taken from NIOSH Figure 8-2 and falls within the Lower risk level (Table C-1) within NIOSH Occupational Exposure to Heat and Hot Environments publication. **/1/**

4-21.3 Supply Distribution System.

Design system to provide:

- Supply air from the air handling unit through a continuous graduated plenum that is gradually tapered to produce an even pressure along the length of the plenum.
- A single or double duct with an adjustable damper leading from the tapered plenum to each diffuser section.
- Interconnected double wall radial diffuser sections at the top of the back wall above the viewing window, with each section a maximum 5 ft. (1.5 m) long. Design and size diffuser sections to provide enough surface and free area to smoothly transition air as it moves to the firing line. Radial diffusers may be half or quarter round.
- Noise from supply system limited to 70 dBA or less when measured at the most uprange firing line, with no whistling noise coming from the diffusers.

- Single stage Minimum Efficiency Reporting Value (MERV) 8 supply filters as a minimum.
- A supply filter system that prevents filters from being pulled into fan.
- Align dampers within the diffuser sections with lane dividers in order to facilitate testing and balancing.

For high debris areas, provide double stage supply filters consisting of a minimum MERV 8 filter followed by a MERV 13 filter. Take the direction of the prevailing local winds into consideration when selecting location and direction of supply intakes.

4-21.4 Exhaust System.

Design exhaust system to provide:

- An air volume of minimum 110 percent of the rated supply volume of air.
- An exhaust plenum located above and downrange of the trap entrance, with a semi-continuous slot at the intake spanning the entire width of the shooting lanes.
- Minimum exhaust duct velocities of 2000 ft./min (57 m/min).
- Air velocities of 350 to 450 fpm (10 to 13 m/min) across the filter media.
- A two-stage filtration system with a MERV 15 Bag filter no less than 26 in. long (66 cm) followed by a HEPA filter with a 99.95 percent efficiency rating.
- Three-stage HEPA rated racks, leaving one stage empty for future flexibility.
- AHUs sized to provide minimum 5 in. (127 mm) of external static pressure for filter loading over clean required static pressure.
- Factory HEPA rated filter housing for the HEPA filter.
- AHUs and filter housing with a minimum 4 ft. (1.2 m) clearance from all adjacent features.
- Filters capable of being removed and replaced by hand without any special tools or equipment.

4-21.5 Controls.

Incorporate a Direct Digital Control (DDC) system to:

- Initiate supply and exhaust fans at low speeds that ramp up to field adjustable levels as necessary to reach desired negative pressure inside the range.

- Provide gradual adjustments to power and prevent noticeable hunting and modulation of the AHUs.

Note: Values for adjustable parameters must be selected during design and adjusted during balancing as necessary to optimize air movement.

Incorporate the following:

- Two clearly labeled emergency red mushroom cutoff switches wired directly to the supply and exhaust VFDs and the heat enable that manually and safely shut off the entire ventilation system. Locate one switch in the training area behind the firing line and the other inside the range control booth.
- **\1\ /1/**
- A ventilation control panel located in the range control booth with diagnostic screen, an on/off switch, and three condition lights on the panels: Safe to Shoot, Warning, and Do Not Shoot. Locate panel such that all condition lights are easily visible from all positions inside the booth.
- Diagnostic screen that scrolls though all conditions, settings, and status.

Require all controls and logic necessary to produce the following light conditions:

(1) Condition-Green Safe to Shoot light:

- All systems are within operating parameters.

(2) Condition-Yellow Warning light:

- Pressure drop across exhaust pre-filter is past adjustable set point.
- Pressure drop across exhaust HEPA filter is past adjustable set point.
- Pressure drop across supply filters is greater than an adjustable set point.
- Range temperature is outside given adjustable set points.

(3) Condition-Red Do Not Shoot light. If any of these conditions occur, controls will sound alarm and shut down range ventilation system:

- Either supply fan or exhaust fan is off.
- Pressure differential for any of the air filters is outside extreme limits.
- Doors leading into the range from the air lock vestibule remain open for more than a given set point, with an adjustable set point initially set to 5 min.
- Door into trap area is opened.

- Any door leading into the range training area from outside is opened.
- Range pressure is outside the upper limit of zero in. of water and the lower adjustable limit for a given time limit initially set to 2 min.
- Supply static pressure is below adjustable limit.

4-21.6 Acceptance Testing.

Test all new ventilation systems and any system where modification or adjustments have been made that would impact airflow.

4-21.6.1 Controls.

Test all controls for proper operation including fan start up and initiation, emergency cut offs, control panel operation, and all light conditions.

4-21.6.2 Air Flow.

Uprange:

Take measurements at the most uprange firing line in the center of each lane at 1 ft. (0.3 m), 3 ft. (0.9 m), and 5 ft. (1.5 m) off the floor. Test with clean filter first, then block off portions of HEPA filters to simulate a yellow warning condition and retest. Acceptable readings for both scenarios are:

- No single reading under 50 fpm (15 m/min) or over 120 fpm (37 m/min).
- Each lane average between 60 fpm (18 m/min) and 90 fpm (27 m/min).
- Range average between 71 fpm (22 m/min) and 79 fpm (24 m/min).

Downrange:

- With clean filters and measurements taken at the most downrange position nearest bullet trap but no closer than 9 ft. (3 m) from trap, take three measurements at each lane at 5 ft. (1.5 m) off floor.
- Average of three lane readings must be between 50 fpm (15 m/min) and 80 fpm (24 m/min).

Retest as necessary until all acceptance standards are met.

Notes:

These acceptance test standards only apply to new ventilation systems and replacement of existing systems. For existing systems use NEHC TM 6290.99.

All meters can be unreliable when measuring non-ducted air flow of 50 fpm (15 m/min) and below. When 90 percent of the measurements along one line are acceptable, smoke tests should be used to verify the unacceptable readings. If the smoke tests

show steady air movement downrange at these locations, they should be considered acceptable.

4-22 RANGE OPTIONS.

4-22.1 Relocatable Ranges.

Relocatable ranges constructed of modular sections are designed to be disassembled and relocated using standard overland transportation to alternate locations as the training requirements change or are relocated. To provide this relocatable capability the relocatable modular range must meet all requirements for indoor ranges above with the following exceptions:

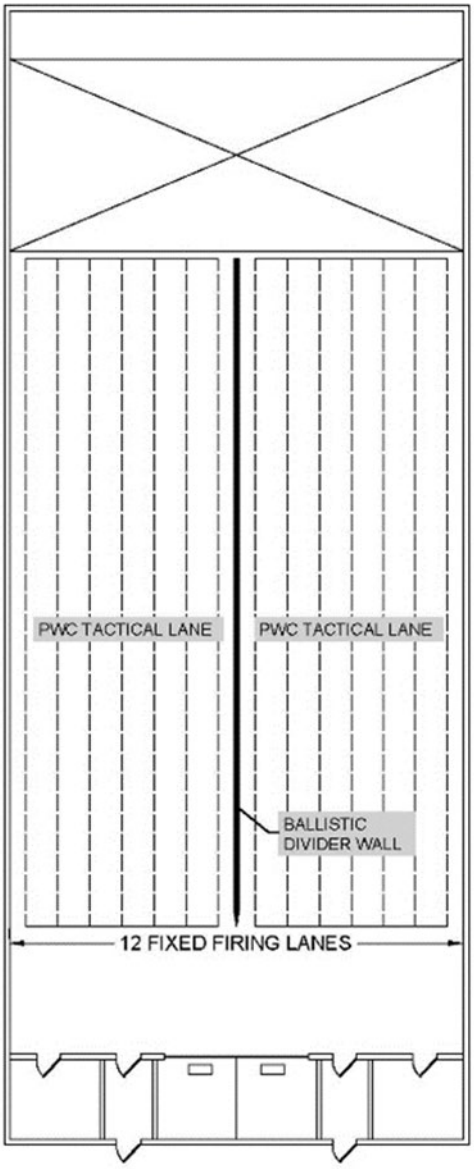
- Indirect Support Areas are not required.
- The range control booth may double as the air lock vestibule on small ranges with three or fewer lanes.
- Buffer between end lanes and side wall is not required and distance from back wall to firing line may be reduced to 12 ft. (3.6 m). These modifications are allowed because relocatable ranges can be sealed better than typical indoor ranges and this improves the airflow control.
- The range control booth back to front distance may be reduced to 8 ft. (2.4 m).
- The floor may be 0.375 in. (9.5 mm) AR500 steel plate with support to prevent sagging. Provide a slip-proof coating. Do not apply any surface on the flooring that prevents the bullets from reaching the bullet trap or that will entrap firing residue and hinder the cleaning of the range floor.
- For ranges with defined lanes where no angled shooting is allowed, a more compact steel trap may be used with 0.5 in. (12.7 mm) AR500 steel plates, a vertical throat with replaceable knife edged sides lined up with lanes and rated for the intended ammunition. The range ventilation exhaust may be routed though the trap to function as the dust collection system.
- **\1** When a granulated rubber trap is used, the additional space for a possible future steel trap is not required. **/1/**
- In lieu of concrete, the downrange wall behind the trap may use **\1** 0.375 in. (9.5 mm) **/1/** AR500 steel plate for ballistic containment.

4-22.2 Combination Fixed and Tactical Range.

A range with a ballistic center wall extending from the firing line to the base of the bullet trap can be used to increase flexibility by ballistically dividing the training past the firing line. An example is shown in Figure 4-7 that allows the range to operate as either:

- One 12 lane range with a fixed firing line to accommodate the Navy's OPNAVY 3591 rifle qualification course.
- Two tactical lanes with moving and shooting downrange at the same time to accommodate the Navy's OPNAV 3591 Practical Weapons Courses (PWC).

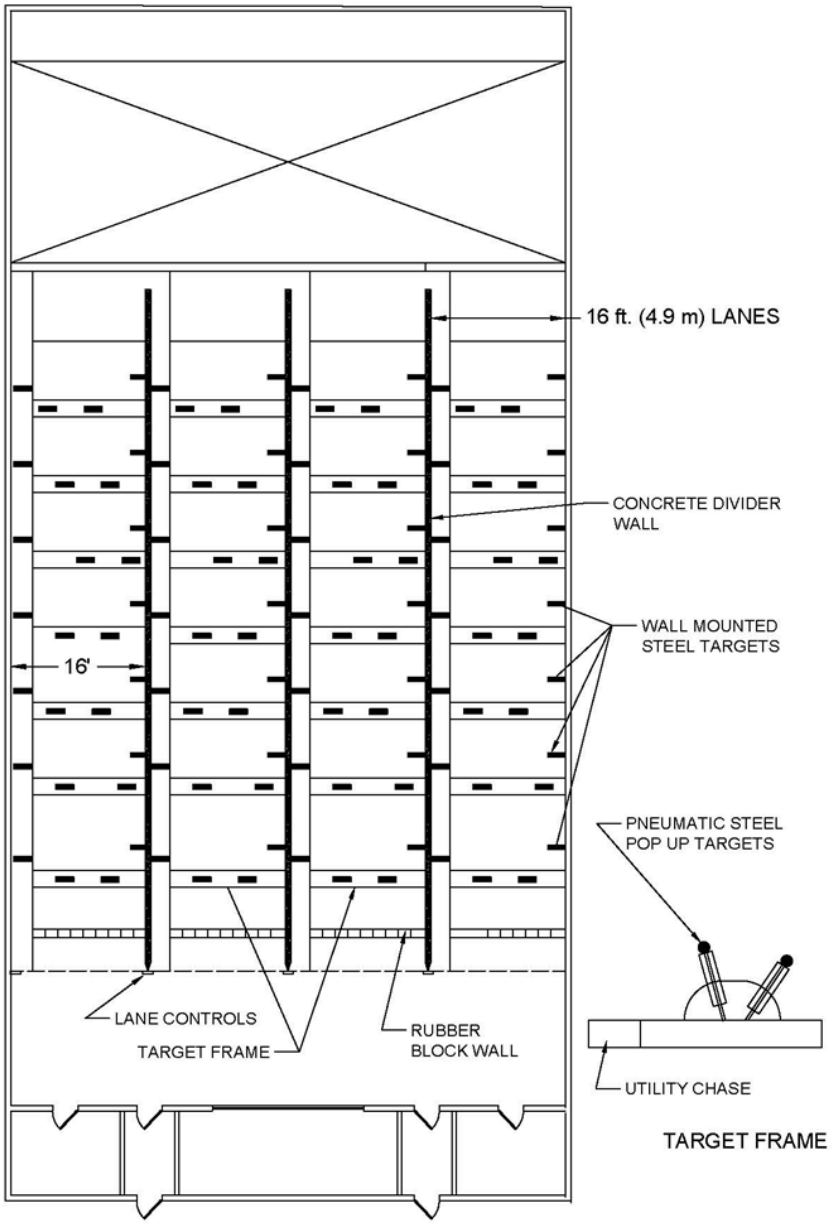
Figure 4-7 Range with Ballistic Divider Walls



4-22.3 Steel Reactive Range.

Advanced training with a knockdown steel target system provides immediate feedback to the shooters. One example is shown in Figure 4-8 but can be varied to meet training and maintenance objectives. This example has 16 ft. (5 m) wide lanes with a series of popup steel head plate targets in each lane. Limit ammunition to frangible rounds or as necessary to prevent rounds and splatter from coming back towards shooter and to minimize damage downrange. Design side walls and lane divider walls for direct hits and splatter where targets are placed near side walls. A control system and hit sensors can be designed to track and score hits. Protect target bases from direct hits.

Figure 4-8 Steel Reactive Range



4-22.4 Wide Angle Shooting.

Ballistic protection can be provided on side walls to allow shooting at angles of 180-degrees (side to side) or more. Downrange protection is provided by a bullet trap. There are several design options for protecting the walls with varying degrees of protection, space, and cost including:

- Placing 0.375 in. (9.5 mm) thick AR500 steel plates with splatter protection to a height of 8 ft. (2.4 m). This is only recommended when all rifle ammunition can be limited to frangible rounds.
- Covering the concrete side walls to a height of 8 ft. (2.4 m) with AR500 steel plate, with another wall in front consisting of a series of angled overlapping AR500 steel similar to a venetian blind trap and covered with splatter protection. The removable plates are sacrificial and should be sized and designed to meet the intended training and allow for easy removal and replacement. This is only recommended when all rifle ammunition can be limited to frangible rounds and rounds that do not have penetrators in the tip.
- Placing an 8 ft. (2.4 m) wall section designed with 0.375 in. (9.5 mm) AR500 steel plate, an approximate 2 ft. (0.6 m) air space, and a 12 in. (300 m) thick ballistic rubber block wall on the exposed shooting side. A wooden support system may be needed to secure the ballistic rubber blocks in place. The space is required to allow inspection of the underlying steel plates.
- Placing bullet traps along the side walls. This provides a high level of protection to the side walls but requires a significant amount of space.

CHAPTER 5 STEEL CLOSE QUARTER FACILITIES

5-1 GENERAL

Close Quarter Combat (CQC) facilities, also known as shoothouses, allow up to 360-degree shooting into ballistic walls. These structures can be built to simulate locations where close quarter combat training may be needed including residential, commercial, industrial, and shipboard environments. CQC facilities may have the following features:

- A full ballistic enclosure that contains all rounds within the facility.
- Ballistic walls with a separate ballistic roof above.
- No ballistic roof. – These are considered outdoor ranges and require a 360-degree SDZ or a waiver.
- Catwalks across the tops of the ballistic panels that allow RSOs to monitor training below.
- Ventilation provided by either a mechanical system, open eaves to encourage natural air movement, ceiling fans, or some combination of these.
- Non-ballistic walls and limited to non-lethal force-force rounds.

5-1.1 Applicability.

This chapter provides criteria for live fire CQC facilities that have steel ballistic walls, a ballistic roof, and limited to:

- Frangible rifle rounds and pistol rounds fired directly into ballistic walls. Note: Frangible rounds produce less airborne contaminants, have reduced ricochet potential, do significantly less damage to steel plates, and greatly reduce the chance of wall failure.
- Ball rounds without tungsten or steel penetrators fired into bullet traps as the primary impact surface, with ballistic walls providing secondary containment.
- Facilities with formal, documented, routine inspections of all ballistic steel plates. All live rounds have the capability to eventually penetrate any ballistic wall and therefore routine inspections are critical.
- Shooting and movement training. These facilities are not intended for multiple shooters firing multiple rounds in one area in a short period of time which can overwhelm the ventilation system.

For Army shoothouses, refer to the information contained in DA Pam 385-63, TC 25-8 and the RDG for training intent, standard shoothouse layouts, design information, instrumentation, support facilities, etc. In the event of conflicting information, these documents take precedence over this UFC for Army shoothouses.

5-1.2 Items Not Addressed.

This Chapter does not apply to CQC facilities and shoothouses where:

- Rounds with tungsten or steel penetrators, such as M855 5.56 mm and M855A1 5.56 mm, are allowed.
- Explosives are used. Explosives requirements are outside the scope of this criteria.
- Shock Absorbing Concrete (SACON) is used for the ballistic walls.

For these facilities follow service provided guidance.

5-1.3 Design.

The design must address:

- Ballistic containment.
- Targetry.
- Fire protection and alarms.
- Lighting.
- Laser use.
- Ventilation to provide a safe training and working environment.
- Maintenance and Storage.
- Noise reduction to the extent possible.

5-2 RANGE AREAS.

A CQC facility can be divided into two different areas:

(1) Live fire area where training occurs.

(2) Support area.

5-2.1 Live Fire Area.

Size area and design ballistic panel layout to support intended training. Careful coordination with trainers is critical to provide a combination of hallways, doors, room sizes, and other training features that maximize training value. Recommend panel layout be approved early in the design phase. Strategically placed movable or swap-out panels may be used to allow significant floor plan changes with minimal effort and panel adjustments. Options include:

- Ballistic panels hung on rollers that slide on a track system above.

- Pivoting panels. As an example, a selected panel that creates a dead end on a hallway in one scenario may be designed to pivot 180 degrees opening that hallway but creating a dead end on an adjacent hallway.
- Swap-out panels designed to allow simple switching between wall and door sections.

When incorporated, design movable and swap-out panels to:

- Maintain ballistic protection between panel, floor, and adjacent panels.
- Allow changes that can be made by two people within a reasonable time with simple hand operated equipment is recommended.

When movable or swap out panels are used, consider requiring mock up panel sections for approval before full scale installation by contractor.

5-2.2 Direct Support Areas.

Design must account for the following:

- Storage for targets, range equipment, and expendables such as splatter protection and spacers.
- Maintenance area for range equipment, targets, and expendables.
- Mechanical and electrical rooms.
- Control space for lights, monitoring, and recording systems.

Restrooms, lockers, and showers may also be provided to support personnel inside the CQC facility.

5-3 EQUIPMENT AND SPECIAL EFFECTS.

Equipment and special effects to enhance training may be incorporated into the design, including:

- Camera systems and two-way Public Address (PA) system throughout.
- Equipment to produce special effects including smoke, lighting, sound, and smells.
- Digital Video Recorder (DVR) systems for recording training and providing after-action review.
- Simulator equipment to project moving targets onto ballistic panels with cameras that can sense and record hit and misses.

5-4 TARGET SYSTEMS.

Target systems may include any of the following:

- Paper targets.
- Overhead rail targets.
- Popup targets.
- Three-dimension (3-D) Targets that are visible when using NODs.

5-5 ALARMS.

Provide audio and visual alarms activated by mushroom switches at key locations on walls and catwalk. Design system to provide the following results when activated:

- Lights and alarms turn on.
- Ventilation system shuts down.
- Special effects, when provided, turn off.
- Magnetic doors, when provided, unlock.

5-6 FIRE PROTECTION.

Each CQC facility is unique and fire protection requirements such as life safety and means of egress, sprinkler systems, fire alarms, and other passive and active systems will vary based on the mission and features of the individual CQC. Therefore, coordinate with the DFPE early in the planning and design process for fire protection requirements.

5-7 LIGHTING AND ILLUMINATION.

Select lighting and illumination based on training goals, requirements, and:

- Include dimmable lighting throughout.
- Locate all lighting above ballistic panels. One option is a grid tracked system just above the panels.
- Include illuminators at key locations on catwalks, exits, and in training area that will not interfere with the light spectrum of Night Vision Devices.

5-8 NOISE.

Design to reduce ambient noise and noise from gunfire to the extent possible. The requirements in Chapter 4 are not feasible and do not apply to the training area. For classrooms and administrative rooms, meet the noise requirements in chapter 4 for these rooms.

5-9 LASERS.

Design for laser use by eliminating all reflective surfaces inside the range. Provide a nonreflecting coating on all surfaces visible from the live fire area including:

- Walls and ceilings.
- Joists and beams.
- Ductwork.
- Door and other hardware.
- Housings for cameras and special effects equipment.
- Exposed piping and utility features.

Exceptions: Any part of any feature where a coating would interfere with its operation including sprinkler heads, lights bulbs, lens, and emergency switches.

5-10 BALLISTIC PROTECTION.

5-10.1 Ballistic Walls.

All wall surfaces subject to live fire must have ballistic panels composed of a minimum 8 ft. (2.4 m) tall and 0.5 in. (13 mm) thick AR525 steel plate with splatter protection covering all surfaces exposed to live fire. Minimize the need for welding and only allow techniques that do not reduce ballistic properties.

5-10.1.1 End Closure.

Design panels with ballistic steel end closures so that there are no panels with open sides or tops for ricochets to escape. This includes all panel tops, doors, and ends of termination panels. Closure must be minimum 0.375 in. (9 mm) AR525 steel plate.

5-10.1.2 Joints.

Provide complete ballistic protection across joints. Where ballistic steel panels cover concrete walls, plates may be bolted to the concrete using concrete anchor fasteners with a flat AR525 steel plate of same thickness as panel covering the joint.

5-10.2 Ballistic Roofs and Decking.

Design the roof to provide weather protection and ballistic containment consisting of either:

- Minimum 3 in. (76 mm) thick concrete.
- 0.375 in. (9.5 mm) thick AR500 Steel Plate.
- Bullet resistant fiberglass panels UL 752 protection level 8.

For multi-story CQC facilities, design deck between floors subject to direct fire on either side with a minimum 4 in. (150 mm) thick concrete, 0.375 in. (9.5 mm) AR500 steel, or ballistic equivalent.

5-10.3 Exterior Openings.

Design exterior openings subject to live fire to prevent rounds from escaping through a combination of:

- Controls and limitations.
- Lockable Level 7 UL 752 ballistic doors.
- Offset ballistic exterior walls covering exits.

5-10.4 Army Shoothouses

- Army shoothouses not designed to support EPR rounds require an exception to standard in accordance with AR 350-19.
- Army shoothouses do not require a ballistic roof; an SDZ deviation may be required.
- The ballistic walls are intended for secondary containment only, bullet traps or hot walls are required behind targets to capture the majority of rounds.
- Bullet traps must be designed for the specific rounds that will be fired in the facility.
- Moveable/sliding covers are an option for covering exterior openings.
- Other materials, as shown in DA Pam 385-63, are allowable for the shoothouse walls.

5-11 CATWALKS.

Catwalks may be included in the design when required to support the training or to provide the range safety officer with visibility and control. Design layout such that all rooms below are observable from positions on the catwalk. Provide stairs to the catwalk outside the ballistic panel enclosure. Where roof overhangs perimeter panels, consider locating the stairs outside the panels but inside the roof line. Retractable vertical ladders may be provided to allow floor access from catwalks above. Ladder should be in the raised position until needed. Catwalks can be supported from above to allow reconfiguration of the panels below in the future.

5-12 VENTILATION.

Consider maintenance and noise to adjacent areas when selecting location of ventilation equipment. Ventilation requirements in Chapter 4 do not apply. Design a mechanical ventilation system to:

- Create air movement within all rooms that clears smoke between training runs.
- Provide each fan with VFD and DDC controls tied to the control room to allow gradual start up and adjustment for obtaining optimal air movement.
- Limit all motors to 75 horsepower or less.
- Minimize noise and vibrations. Provide fans with vibration spring isolation that meet seismic requirements.
- Provide a Noise Criterion (NC) rating of less than 50 on exhaust grills during normal facility operations.
- Roof access to mechanical equipment that meets safety and force protection requirements.

Army ventilation requirements are contained in DA Pam 385-63.

5-12.1 Air Flow Requirements.

Design system to move air and clear smoke from all live fire rooms that meets the following:

- Top to Bottom Systems: A minimum cfm (m/min) to provide a vertical air velocity of 25 fpm (7.2 m/min) in all live fire areas.
- Over the Top and Open Eave Systems: Design system to clear smoke from all rooms within three minutes and all hallways within six minutes. To achieve this, the designer must specify a minimum cfm (m/min) based on the design and account for short circuiting, but as a minimum use 40 air changes per hour (ACH).

Note: A cfm selected based on 20 ACH will theoretically clear smoke within 3 minutes. Smoke will usually take much longer to clear due to short circuiting and inefficiencies.

5-12.2 Design Documents.

Design documents must include:

- Location and cfm for all AHUs.
- VFDs on all supply and exhaust motors.
- Roof penetrations and curb detail for all roof mounted equipment.

- Location and sizing of ductwork. Coordinate with catwalk and structural features.
- Location and sizing of supply and exhaust diffusers and registers.
- Filters location and requirements.
- Acceptance test requirements.

5-12.3 HEPA Filters.

The requirement for HEPA filters on the exhaust will be made on a case-case basis as determined by the responsible local environmental office. When HEPA filters are required, design as follows:

- Locate all exhaust AHUs on the ground.
- Provide two stage filtrations using a MERV 15 Bag filter no less than 26 in. (66 m) long followed by a 99.97 percent HEPA filter.
- Provide 3 stage HEPA rated racks, leaving one stage empty for future flexibility.
- Include 4 in. (100 mm) of external static pressure for filter loading in addition to that required for operating with clean filters.

5-12.4 Contractor Experience.

It is highly recommended that a range ventilation contractor, experienced in providing systems with similar requirements, is made responsible for the final design and construction of the ventilation system including controls and balancing. An approach similar to that recommended in Appendix B for indoor ranges can be used.

5-12.5 Acceptance Tests.

Acceptance tests must include the following:

- Air flows at supply and exhaust: Test and balance each supply diffuser and exhaust register against the design air flow. Provide acceptable readings based on system provided.
- Smoke Tests: With the system set in training mode with doors shut and the ventilation system turned on, release smoke into each room using smoke machines capable of filling rooms with smoke. Smoke in all rooms must show movement and signs of clearing and be completely clear within the time specified. Any rooms where smoke is stagnant or fails to clear room completely within time specified constitutes failure requiring the contractor to readjust and modify system until all rooms pass test.

5-13 ENCLOSED CQC FACILITIES.

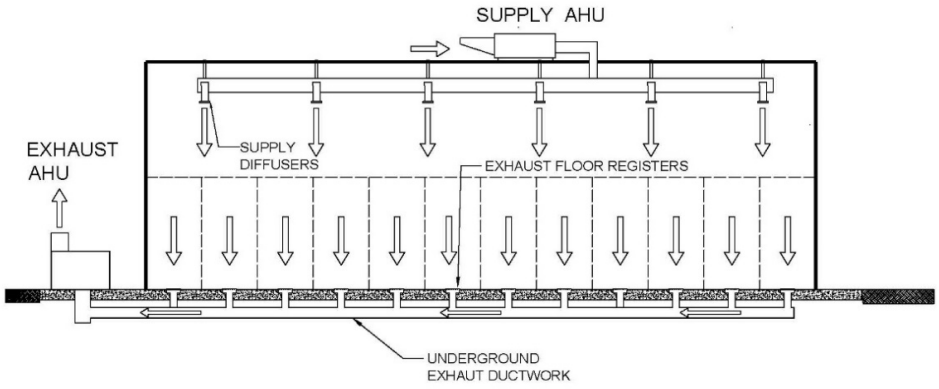
A concrete structure with a ballistic roof to prevent any round from leaving the facility. Ballistic steel panels with splatter protection must cover all surfaces subject to live fire. Multiple levels may be provided.

5-13.1 Top to Bottom Ventilation System.

Design a mechanical ventilation system that supplies air from the top and exhaust air through floor registers spaced a maximum of 10 ft. (3.0 m) on center. Floor registers must be flush with floor and a maximum of 0.25 in. (6 mm) openings to prevent brass from entering pit. Coordinate floor register layout with panel layout to minimize the number of walls on top of floor registers. See Figure 5-1.

Army ventilation requirements are contained in DA Pam 385-63.

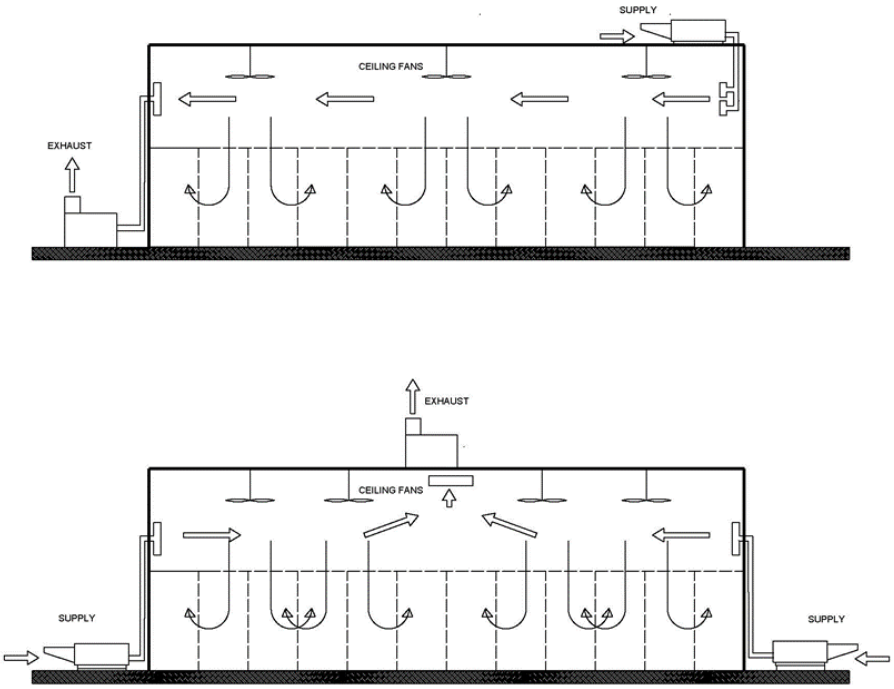
Figure 5-1 Top to Bottom Ventilation System Schematic.



5-13.2 Across-the-Top Ventilation System.

Design a mechanical system that moves air across the top of the panels with supplemental blowers or ceiling fans to push air down into the rooms below. AHUs can be roof or ground mounted. The schematics in Figure 5-2 show options for roof and ground mounted AHUs.

Figure 5-2 Across-The-Top Ventilation System Schematics.



5-14 CQC FACILITIES WITH OPEN EAVES.

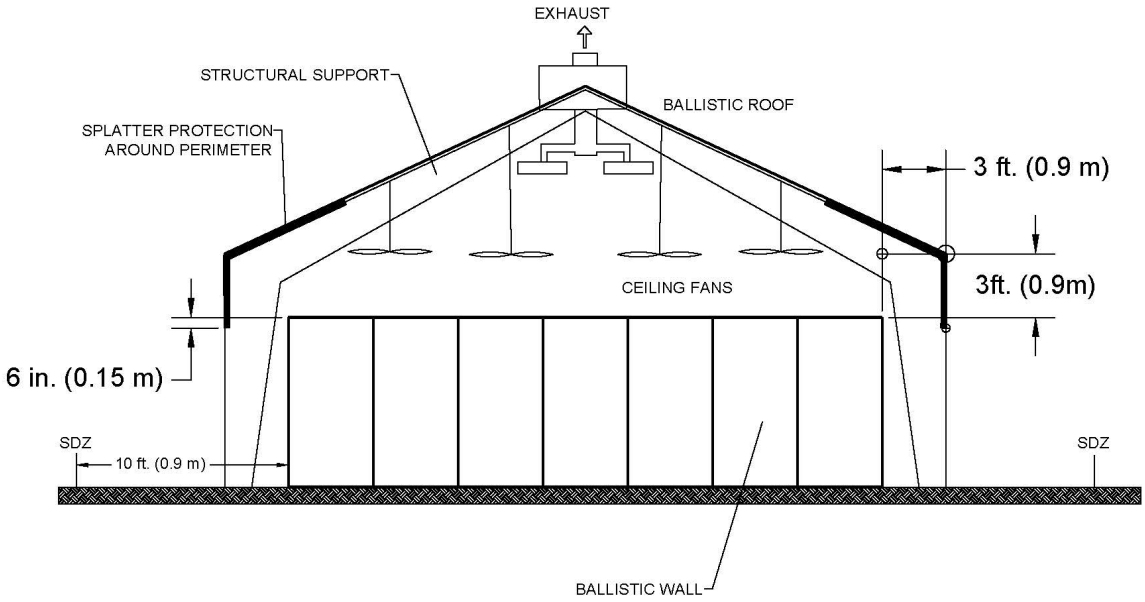
This facility has ballistic steel plates connected to a concrete floor, with splatter protection on all shooting sides. A separate roof structure is built over the ballistic walls with structural columns connected to the concrete outside the ballistic walls creating an open eave in between.

5-14.1 Minimum Distances.

As a minimum, provide the following clearances between ballistic roof and walls:

- Minimum 3 ft. (0.9 m) above ballistic walls.
- Minimum 3 ft. (0.9 m) away from ballistic walls.
- Roof sides extend a minimum 0.5 ft. (0.15 m) below height of ballistic walls.
- See Figure 5-3.

Figure 5-3 Ventilation System Supplemented with Natural Airflow



5-14.2 Ventilation.

Design system with open eaves to promote natural air movement supplemented with ceiling fans or blowers and exhaust fans pulling air from above.

Army ventilation requirements are contained in DA Pam 385-63.

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APPENDIX A BEST PRACTICES

This information is guidance and not requirements. The main purpose is to communicate proven system/facility solutions and lessons learned and may not be the only solution to meet UFC requirements.

A-1 INDOOR RANGE VENTILATION CONTRACTING STRATEGY.

Providing a ventilation system that limits exposure to airborne contaminants is challenging because:

- Range ventilation is a significant portion of the construction cost.
- Performance testing includes measuring airflow velocities at each lane and firing position and comparing them to strict acceptance standards, and this typically comes near the end of the project.
- Meeting the required average airflow velocity across the width of the range is relatively easy, but meeting airflow requirements at each lane and firing position can be very difficult.
- Numerous failures have occurred when inexperienced range ventilation contractors were used.
- When failures occur, it can be difficult to determine whether the problems are related to the design, construction, controls, balancing, or testing. It can be especially difficult when these responsibilities are split between several sub-contractors, which is typically the case.
- The problem persists with both full design and design-build projects.
- Should the system fail to meet the acceptance standards, it may be difficult and time consuming to resolve problems. Significant rework may be required.

Therefore, it is highly recommended that the contract documents only allow range ventilation contractors with proven experience meeting these or similar performance standards and require that this contractor be responsible for the final design, construction, controls, testing, and balancing of the system. In addition:

- Range experience alone should not be considered, it must be experience meeting similar performance requirements since the majority of non-DoD indoor ranges do not use these stringent standards.
- The acceptance testing should be witnessed by experienced government personnel or third parties to verify all tests are performed properly.

A recommended contracting strategy is provided below.

A-1.1 Phase 1 – Requirement Development.

For Design-Build (DB) projects, this is the Request for Proposals (RFP). For Design-Bid-Build (DBB) projects, this is the project design phase.

For DBB and DB projects, include the following in the contract documents:

- Power supply location, and verification that power is sufficient.
- Minimum air flow in cubic feet per minute (cfm) and cubic meters per minute (m3/min.) required for both supply and exhaust systems.
- General location of Air Handling Units (AHU), including whether they are roof or ground mounted. Require stair access to roof when AHUs are located on roof.
- General location of dust collection and spent round collection systems.
- General location of ductwork and diffusers.
- Filter and filter rack requirements.
- Heating requirements.
- Cooling requirements. Cooling is only required in extremely hot climates.
- Ventilation contractor’s experience requirements.
- Design requirements edited for the project, with all options selected or clarified as appropriate.
- Acceptance testing requirements.

For DBB projects, the additional detail below is required to allow coordination with other design disciplines:

- Location of AHUs. Provide estimated weights and electrical loads of all equipment.
- Power connection details.
- Location and general sizing of ductwork, dampers, and radial diffuser in enough detail to allow coordination and avoid conflicts with other design disciplines.
- Exact location of VFDs, control panels, and emergency cutoffs switches.
- Roof penetration and curb details shown for all AHUs and ductwork.
- Section at wall between range control booth and training area showing radial diffuser, ductwork to diffusers, viewing window, suspended ceiling, and structural ceiling.
- Stair access when exhaust AHUs are roof mounted.

Options to be selected and included in the Phase 1 stage:

- Location of supply AHUs: Locate on the roof when possible and centered with symmetrical ductwork leading to the supply diffusers.
- Location of exhaust AHUs: Locate on the ground when possible to allow easy replacement of HEPA filters. When located on the roof, stair access must be provided.

A-1.2 Phase 2 - Ventilation Contractor Requirements.

Make the ventilation contractor responsible for providing the final design, construction, controls, balancing, and final acceptance testing of the range ventilation system. Require that contractor to have completed a minimum of five indoor range ventilation projects with similar design and acceptance testing requirements, including 75 fpm (23 m/min.) air velocity when measured along the entire rear firing line and at least three different heights. During the bidding process the ventilation contractor is encouraged to submit a Request For Information (RFI) if, in their opinion, the Phase 1 design requirements will not result in a system that meets the performance acceptance tests.

Have the ventilation contractor provide:

Prior to starting work:

- Proof of previous experience, including contract documents from each project showing design and acceptance test requirements, along with final acceptance test reports.
- A confirmation that they can provide a system meeting the Phase 1 design and the acceptance testing performance requirements.
- Full design of ventilation system including duct design and supply, exhaust, and filter schedules.

At end of work:

- Prior to acceptance testing, a detailed testing plan for approval with a checklist and step-by-step procedures in a logical sequence.
- Acceptance testing performed in the presence of the Contracting Officer Representative. Provide all materials, equipment, and personnel necessary to perform the tests including smoke generators, air flow meters, communications, plan, and checklist.
- Operations and Maintenance manuals.
- A minimum 8 hours of on-site training covering operations, maintenance, and troubleshooting of the entire range ventilation system.

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APPENDIX B DOD WEAPONS AND AMMUNITION

A wide variety of small arms weapons and ammunition is used throughout DoD. Some common weapons and ammunition categories are listed below. The Army's Hazard Classification of United States Military Explosives and Munitions is a useful guide that provides detailed information on every DoD approved round including a unique identifier known as the Department of Defense Identification Code (DODIC).

B-1 WEAPONS.

- 12-gauge Shotguns.
- Pistols/handguns: 9 mm and .45 cal.
- Rifles : M4/M16 5.56 mm variants, M14 7.62 mm.
- Crew Served Weapons: M249 5.56 mm and M240 7.62.
- M2 .50 cal. Machine gun.

B-2 CATEGORIES OF SMALL ARMS AMMUNITION.

Most weapons can chamber different types of ammunition with different characteristics. Here are some different types of ammunition and typical uses:

- Short Range Training Ammunition (SRTA): These training rounds much shorter maximum distances than standard rounds allowing them to be used in areas where SDZs prohibit standard ammunition. Some SRTA rounds rely on light plastic projectiles to limit distance and others rely on projectile design to intentionally destabilize the flight path. These rounds are typically lethal and should not be confused with non-lethal training rounds.
- Frangible rounds: These training rounds are designed to disintegrate into tiny particles after impacting steel for minimizing penetration, reducing back splatter, and reducing damage to range components on indoor ranges and Shoothouses. They create more fragment and dust which may increase filter loading. These rounds are lethal and should not be confused with non-lethal training rounds.
- Reduced and zero lead content rounds: Some rounds are completely lead free. Other have small amounts of lead in the primer to prolong shelf life. These rounds can reduce or eliminate the chance of lead exposures and may reduce the costs of disposal of range filters and clean up debris. However, they may contain other potentially harmful compounds and therefore do not lessen range ventilation requirements.
- Non-lethal ammunition: These rounds allow force on force training (participants shoot at each other). They do not imply zero risk and serious injury can occur if not used properly. The DoD versions typically have small amounts of lead in the primer to increase shelf life.

- Rounds with steel penetrators: These rounds have steel penetrators to increase penetration through steel, but generally not to the extent of AP rounds.
- Armor Piercing (AP): These rounds have tungsten tips (or penetrators) to increase penetration through steel. These should not be allowed on indoor ranges, or on outdoor ranges with steel bullet traps or steel targets.
- Tracer rounds: Typically used in belt fed weapons loaded with standard rounds plus a tracer round every fourth or fifth link. Tracer projectiles contain a pyrotechnic making the trajectory visible and enabling the shooter to make aiming corrections. These should not be allowed on indoor ranges and shoothouses.
- Breacher Rounds: Shotgun slug or shot made especially for employment close range into door hinges.
- Multiple Properties: Some rounds have multiple characteristics such as being both lead free and frangible, or SRTA and frangible.

APPENDIX C GLOSSARY

C-1 ACRONYMS

AFCEC	Air Force Civil Engineer Center
AHU	Air Handling Unit
AP	Armor Piercing
AR	Army Regulation
AR	Abrasion Resistance (When used in conjunction with steel plate)
BIA	Bilateral Infrastructure Agreement
BMP	Best Management Practices
CCMCK	Close Combat Mission Capability Kit
CFR	Code of Federal Regulations
CQC	Close Quarter Combat
DA PAM	Department of the Army Pamphlet
dBA	A-weighted decibels
DB	Design Build
DBB	Design-Bid-Build
DDC	Direct Digital Control
DF	Direct Fire
DoD	Department of Defense
DODIC	Department of Defense Identification Code
EOD	Explosive Ordnance Disposal
EPR	Enhanced Performance Round
FAA	Federal Aviation Administration
FL	Firing Line
FLFS	Firing Line Floor Surface

GIS	Geographic Information System
HBW	Hardness Brinell Wolfram (Tungsten)
HE	High Explosive
HEPA	High Efficiency Particulate Air
HNFA	Host Nation Funded Construction Agreements
HQUSACE	Headquarters, U.S. Army Corps of Engineers
KD	Known Distance
LAW	Light Antitank Weapon
LLF	Lower Limit of Fire
LOMAH	Location Of Miss And Hits
LOF	Line of Fire
LOS	Line of Sight
MERV	Minimum Efficiency Reporting Value
MCO	Marine Corps Order
MIT	Moving Infantry Target
MOUT	Military Operations in Urban Terrain
NAVFAC	Naval Facilities Engineering Command
NOD	Night Observation Device
NOSSA	Naval Ordnance Safety and Security Activity
OSSHA	Occupational Safety and Health Administration
RCP	Reinforced Concrete Pipe
RDG	Range Design Guide
RFP	Request For Proposal
RMTK	Range Mangers Tool Kit
RSO	Range Safety Officer

RT60	Reverberation Time 60dB
SACON	Shock Absorbing Concrete
SAR	Small Arms Range
SAW	Squad Automatic Weapons
SDZ	Surface Danger Zone
SESAMS	Special Effects Small Arms Marking System
SOP	Standard Operating Procedures
SOUM	Safety of Use Memorandums
SOFA	Status of Forces Agreements
SRTA	Short Range Training Ammunition
STC	Sound Transmission Class
TC	Training Circular
UFC	Unified Facilities Criteria
ULF	Upper Limits of Fire
U.S.	United States
USACE	United States Army Corps of Engineers
UXO	Unexploded Ordnance
VDZ	Vertical Danger Zone
VFD	Variable Frequency Drive

C-2 DEFINITION OF TERMS

Close Quarter Combat (CQC) Facility: A live fire shoothouse that supports short-range training such as room-room clearing.

Crew Served Weapon: Any weapon system that requires a crew of more than one individual to function at optimum efficiency such as a belt fed machine gun.

Direct Fire: Fire delivered to a target within the line-of-sight of the shooter using the target itself as the point of aim.

Distance X: The maximum distance a projectile (to include guided missiles and rockets) will travel when fired or launched at a given quadrant elevation with a given charge or propulsion system.

Double Hearing Protection: Wearing earplugs in combination with noise muffs or noise attenuating helmets. Impulse noise levels can be so high that single hearing protection does not adequately protect hearing.

Dry Fire: Operating a weapon with no ammunition in the chamber. Not all weapons should be dry fired.

Firing Line (FL): The line which consists of firing points or positions, from which weapons systems are fired.

Firing Line Floor Surface (FLFS): The ground surface along the firing line.

Firing Position: The point or location at which a weapon system is placed for firing.

Indirect Fire: Fire delivered to a target when the weapon is not in line of sight with the target.

Line of fire (LOF): An imaginary line drawn from the shooting position to the target.

Live Fire: As used in this UFC, live fire includes use of any potentially lethal ammunition.

Lower Limit of Fire (LLF): An imaginary line consisting of the lowest point on all LOFs combined. This is often taken drawn a prone shooter firing at the lowest target.

Military Operations in Urban Terrain (MOUT) Facility: A mock town or city providing urban warfare training.

Navigable Waterway: Any body of water open to the free movement of marine vessels.

Officer in Charge (OIC): The officer, WO, or Non-Commissioned Officer (NCO) responsible for personnel conducting firing or operations within the training complex.

Partially Contained Range: This range has a covered firing line, side containment, overhead baffles, and a bullet backstop. Direct fire is totally contained by the firing line canopy, side containment, baffles, and bullet trap (no “blue sky” observed from firing positions). Ricochets and splatter are not contained.

Range Safety Officer (RSO): The officer, warrant officer (WO), or noncommissioned officer (NCO) who is the direct representative of the Officer In Charge (OIC) for insuring the adequacy of safety of firing, training operations, and ensuring compliance with laser range safety and local standing operations. Qualifications vary between services.

Reverberation Time 60dB: The time it takes for the sound pressure level to reduce by 60dB, measured after the sound source is abruptly switched off.

Shoothouse: See Close Quarter Combat (CQC) Facility.

Single Hearing Protection: Wearing either earplugs, noise muffs, or noise attenuating helmets.

Small Arms: For this UFC small arms includes all pistols, shotguns, rifles, carbines, submachine guns, light, medium, and heavy machine guns up to and including .50 caliber.

Sound Transmission Class: A rating used to compare the acoustical isolation of different barrier materials or partition constructions.

Surface Danger Zone (SDZ): The ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, and debris, and components resulting from the firing, launching, or detonation of weapons systems to include explosives and demolition.

Upper Limit of Fire (ULF): An imaginary line consisting of the highest point on all LOFs combined. This is often taken drawn from a standing shooter firing at the highest target.

Vertical Danger Zone (VDZ): For non-contained and partially contained ranges, the VDZ is the volume of airspace above the SDZ between the ground surface and the maximum ordinate of a direct-fired or ricochet round. The height of the VDZ varies with the weapon and ammunition fired. For fully contained ranges, the VDZ is the area between the SDZ and the upper limits of containment.

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APPENDIX D REFERENCES

AMERICAN SOCIETY FOR TESTING AND MATERIALS

https://www.astm.org/

ASTM C75, *Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe*

ASTM E10-08, *Standard Test Method for Brinell Hardness of Metallic Material*

ASTM E2235, *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

CODE OF FEDERAL REGULATIONS (CFR)

https://www.gpo.gov/

29 CFR PART 1910.25 *Occupational Safety and Health Administration*

33 CFR 334 *Danger Zone and Restricted Area Regulations*

DEPARTMENT OF THE AIR FORCE

AFMAN 31-129, *USAF Small Arms and Light Weapons Handling Procedures*

AFI 36-2654, *Combat Arms Program*

AFMAN 36-2655, *USAF Small Arms and Light Weapons Qualification Programs*

ETL 11-18, *Small Arms Range Design and Construction*

FC 4-179-03F, *Air Force Indoor Small Arms Range*

DEPARTMENT OF THE ARMY

https://www.Armypubs.army.mil

Army Range Design Guide (RDG) Web Based tool - access provided by project sponsors

AR 350-19, *Army Sustainable Range Program*

AR 350-52, *Army Training Support System*

DA PAM 385-63, *Range Safety*

Range Managers Toolkit (RMTK) – check with sponsor

TC 25-8, *Training Ranges*

USACE Centers of Standardization (CoS)

Outdoor Sports Facility Standards, - check with sponsor

U.S. Army Defense Ammunition Center

Hazard Classification of United States Military Explosives and Munitions

DEPARTMENT OF THE NAVY

https://www.public.navy.mil

OPNAV 3591.F, *Small Arms Range Training and Qualification*

OPNAV 5100.27.B, *Navy Laser Hazard Control Program*

Navy Environmental Health Center

Technical Manual NEHC TM 6290.99, *Indoor Firing Ranges Industrial Hygiene Technical Guide*

Naval Facilities Engineering Command

Military Handbook 1027-3B, *Range Facilities and Miscellaneous Training Facilities Other Than Buildings*

ENVIRONMENTAL PROTECTION AGENCY

https://www.epa.gov/nscep

902-B-01-001, *Best Management Practices for Lead at Outdoor Shooting Ranges*

AP 42, *Compilation of Air Emission Factors*

MILITARY SPECIFICATIONS

Mil-A-46100, *Armor Plate, Steel, Wrought, and High-Hardness*

UNDERWRITER'S LABORATORY

https://www.ul.com

UL 681, *Installation and Classification of Burglar and Holdup Alarm Systems for Alarm System Installation*

UL 752, *Standard for Bullet-Resisting Equipment*

UL 2050, *National Industrial Security Systems - only distributed to those demonstrating relevant national industrial security involvement*

UNIFIED FACILITIES CRITERIA

https://www.wbdg.org/dod/ufc

UFC 1-200-01, *DoD Building Code*

UFC 1-200-02, *High Performance and Sustainable Building Requirements*

UFC 3-120-01, *Design: Sign Standards*

UFC 3-600-01, *Fire Protection Engineering for Facilities*

UFC 4-010-01, *DoD Minimum Anti-Terrorism Standards for Buildings*

UFC 4-020-01, *DoD Security Engineering Facilities Planning Manual*

UFC 4-020-02, *DoD Security Engineering Facilities Design Manual,* (currently in draft and unavailable)

UFC 4-021-02NF, *Security Engineering Electronic Security Systems*

UFC 4-020-04A, *Electronic Security Systems: Security Engineering*

UFC 4-215-01 *Armories and Arms Rooms*

UNITED STATES MARINE CORPS

MCO 3570.1C, *Range Safety*

MCO P3350.10, *Policy and Procedures for Range and Training Area (RTA) Management*

Range Managers Toolkit (RMTK) – check with sponsor