

TOWN OF SIMSBURY

**WATER POLLUTION CONTROL
36 DRAKE HILL ROAD
SIMSBURY, CT 06070**

INVITATION TO BID

FOR

SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS PROJECT DPW 2003-02

The Town of Simsbury is soliciting bids for SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS PROJECT. The scope of work includes furnishing all labor, materials, and equipment necessary for cleaning and repairing the existing concrete clarifier tanks, furnishing and installing a cast-in-place concrete deck supported on steel beams at the two rectangular 95-foot x 20-foot existing primary clarifiers at the Wastewater Treatment Plant (WWTP) and related work as specified.

This project is subject to State of Connecticut Prevailing Wage requirements. Contractors must comply with the State of Connecticut Department of Administrative Services (DAS) Contractor Prequalification Program for any contract over \$100,000. The classification for which construction contractors are being sought is as follows: Water Treatment Plant.

Sealed proposals will be accepted by Amy Merriweather, Director of Finance, 933 Hopmeadow Street (Rt. 10/202), Simsbury, CT until 10:00 a.m., October 26, 2023. A mandatory pre-bid conference site visit will be held October 10, 2023 @ 9:00 AM prior to submission of the bid is also required.

Specifications and bidding documents may be obtained electronically via the Town's web site at the following link: <http://www.simsbury-ct.gov/finance/pages/public-bids-and-rfp>. Bid documents will not be mailed or faxed.

**STANDARD INSTRUCTIONS TO BIDDERS
SIMSBURY WWTP RESTORATION OF PRIMARY
CLARIFIERS PROJECT**

1. Project Overview:

The Town of Simsbury is soliciting bids for furnishing all labor, materials, equipment necessary for restoration of and installing a cast-in-place concrete deck supported on steel beams at the two rectangular 95-foot x 20-foot existing primary clarifiers at the Simsbury Wastewater Treatment Plant (WWTP) and related work as specified.

The scope of work for this project includes furnishing all labor, materials and equipment required to complete the project as specified.

2. Key Event Dates:

Invitation to Bid Issued	September 21, 2023
Mandatory Pre-Bid Conference and Site Visit (36 Drake Hill Road, Simsbury, CT)	October 10, 2023@ 9:00 AM
Questions Due	Complete 7 days prior to Bid Due date
Bids Due	October 26, 2023
Commencement of Work	Within ten (10) calendar days of Notice to Proceed
Substantial Completion	Within two hundred and fifty (250) calendar days of Completion of work

3. Bid Submission Instructions:

- A. One (1) original and one (1) copy of all bids must be submitted in a sealed envelope with the bidder's name on the outside of the envelope and clearly marked "Sealed Bid for Town of Simsbury – SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS PROJECT.". If forwarded by mail or courier, the sealed envelope must be addressed to "Amy Meriwether, Director of Finance, 933 Hopmeadow Street (Rt. 10/202), Simsbury, CT 06070". Bids must be at the office of the Director of Finance prior to 10 a.m., October 26, 2023. Postmarks are NOT an acceptable waiver of this policy. Once the first bid is opened, all bids are deemed final and no corrections or alterations may be made.
- B. Ditto marks or words such as "SAME" must not be used for the bid to be considered.
- C. All information must be submitted in ink or typewritten. Errors, alterations or

corrections must be shown on both the original and all required copies and each must be initialed by the person signing the bid.

- D. Bids are considered valid for ninety (90) days after bids are opened. Bidders may not withdraw, cancel or modify their bid during this ninety (90) day period after bids are opened.
- E. An authorized person representing the legal entity of the bidder must sign bids.
- F. The inability to meet any specified requirement(s) must be stated in writing and attached to the bid form, or written on the bid form. If no exceptions are noted, it shall be assumed that the terms of the Invitation to Bid have been accepted.
- G. The Town of Simsbury reserves the right to waive any minor informality in a bid when such a waiver is in the best interest of the Town.

4. Questions:

Any questions about this project should be directed to Anthony Piazza, Superintendent Water Pollution Control Facility by fax (860) 658-6809, email at apiazza@simsbury-ct.gov, or by mail Water Pollution Control Facility, 36 Drake Hill Road, Simsbury, CT 06070. To receive consideration, such questions must be received at least Seven (7) business days before the established date for receipt of bids. No oral interpretations shall be made to any respondent as to the meaning of any of the bid documents. Every request for an interpretation shall be made in writing.

The Town will respond to all appropriate questions received via an addendum available to all prospective bidders. Such addenda will become part of this Invitation to Bid and the resulting contract. At least Five (5) days prior to the receipt of bids, the Town will post a copy of any addenda to its website, located at: www.simsbury-ct.gov/finance/pages/public-bids-and-rfp. It shall be the responsibility of each bidder to determine whether addenda have been issued, and if so, to download copies directly from the Town's website.

5. Presumption of Bidder Being Fully Informed:

At the time the first bid is opened, each bidder is presumed to have read and is thoroughly familiar with all bidding documents as well as all contract documents for this project. Failure or omission of the bidder to receive or examine any documentation or information concerning this bid shall in no way relieve any bidder from obligations with respect to their bid.

6. Pre-Bid Conference:

A pre-bid conference and site visit will be held at 9:00 am October 10, 2023. The intent of this conference and site visit is to provide an outline of the project and to provide clarification to any potential bidders. Prospective bidders are required to be present at the pre-bid conference and site visit at project site at 36 Drake Hill Road and sign the pre-bid conference sign-in log at the plant and to carefully review the Invitation to Bid in advance of this conference to provide for a

meaningful discussion. Scheduling additional visit may be done by making appointment directly with the plant representatives (Tony Piazza) at 1-860-658-1380. All salient points of the conference and responses to any questions will be provided via addendum.

7. Interpretation of Acceptable Work:

All work on this project is to be in accordance with the specifications, bidding and contract documents are to be interpreted as meaning those acceptable to the Town of Simsbury. Work is to be done in a clean and workman like fashion and meet industry best practices for quality and performance.

8. Wage Rates:

State of Connecticut Department of Labor Prevailing Wage rates apply for any contract over \$100,000. Copies of these wage rates are incorporated in the Contract Documents. Each CONTRACTOR or Subcontractor performing Work on this Project shall comply in all respects with all laws governing the employment of labor, Social Security, and Unemployment insurance of both State and Federal government. Contractors must submit certified payroll documentation with each payment application for processing. Payment applications will not be approved without certified payroll.

9. Tax Exemptions:

The bidder shall be aware that the Town of Simsbury is exempt from Federal Excise Taxes and Connecticut Sales and Use Taxes. Appropriate tax exempt forms will be provided to the successful bidder(s) as part of the contract award process.

10. Insurance Requirements:

The firm must carry insurance under which the Town is named as an additional insured, as follows:

Such insurance must be by insurance companies licensed to write such insurance in Connecticut against the following risks with the following minimum amounts and minimum durations.

- A. Workman's Compensation, as required by State Statute & \$100,000 employers liability limit.
- B. Public Liability, Bodily Injury Liability and Property Damage Liability as follows:

Injury or death of one person:	\$2,000,000
Injury to more than one person in a single accident:	\$1,000,000
Property damage in one accident:	\$1,000,000
Property damage in all accidents:	\$2,000,000
- C. Automobile and Truck (Vehicular) Public Liability, Bodily Injury Liability and Property Damage Liability as follows:

Injury or death of one person:	\$1,000,000
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Injury to more than one person in a single accident:	\$1,000,000
Property damage in one accident:	\$1,000,000
Property damage in all accidents:	\$1,000,000

Insurance under B, and C above must provide for a 30 day notice to the Town of cancellation/or restrictive amendment.

Insurance under B and C above must be for the whole duration of the contract and for twelve (12) months after acceptance of the project by the Town.

Subcontractors must carry A, B, and C in the same amounts as above for the duration of the project and until acceptance by the Town.

Certificates of insurance must be submitted to the Director of Public Works prior to the signing of the contract and within ten days of notification of award of contract. Should any insurance expire or be terminated during the period in which the same is required by this contract, the Director of Public Works shall be notified and such expired or terminated insurance must be replaced with new insurance and a new certificate furnished to the Director of Public Works.

Failure to provide the required insurance and certificates may, at the option of the Town, be held to be a willful and substantial breach of this contract.

11. Substitution for Name Brands:

Should brand name items appear in this bid, the bidder attach specifications for any substitutions and explain how the substitution compares with the specifications of the named brand. The bid must submit the substitution in writing a minimum of two weeks in advance of the use of the product for review by the Town of Simsbury. The decision on whether to use the substitution or the named brand rests solely with the Town of Simsbury.

12. Awarding the Bid:

The Town reserves the right to accept any bid or any part of bids, to reject any, all, or any part of bids, and to waive formalities and informalities in the bidding process. The Town at its discretion will award the bid to the lowest responsible bidder. That bidder is the person or firm who is qualified and competent to do the work, whose past performance is satisfactory to the Town and whose bid documents comply with the procedural requirements stated herein.

Bid Alternates will be awarded if it is determined to be in the best interest of the Town. The Town reserves the right to award any and all alternatives in the order that best suits the Town.

13. Rejection and/or Cancellation of Bids:

The Town reserves the right to reject or cancel any and all bids, or any part of any or all bids, if such action is deemed to be in the best interest of the Town.

14. Delivery Arrangements: Not applicable

15. Bid Bond:

The successful bidder must provide the Town of Simsbury with a Bid Bond prior to commencing work.

16. Performance Bond: Not applicable

17. W-9 Form

The successful bidder must provide the Town of Simsbury with a completed W-9 Form prior to commencing work.

18. Submittals:

The Bidder shall, as soon as practicable, but not exceed fifteen (15) calendar days, after notification of selection of the award of the bid, furnish to the Owner, in writing the following:

- A. Designation of the Work to be performed by the Contractor's own forces
- B. Names of the manufacturers, products and suppliers of the principal items of materials proposed for the work
- C. Project work schedule

19. Agreement Documents:

The Agreement Documents are defined as:

- The Standard Instructions to Bidders
- The Agreement as executed
- The General Specifications
- Any Addenda, if issued

END OF STANDARD INSTRUCTION TO BIDDERS

BID FORM
SIMSBURY WWTP RESTORATION PRIMARY CLARIFIER PROJECT

Pursuant to and in compliance with the "Invitation to Bid" and Standard Instructions to Bidders relating thereto, the undersigned, having visited the sites and carefully examined all Bidding Documents and complete General Specifications together with all Addenda issued and received prior to the scheduled closing time for receipt of Bids, hereby offers and agrees as follows:

- To provide all labor, materials, and anything else reasonably necessary to complete all work per the attached specifications.
- If awarded this Contract, we will execute a Contract with the Town of Simsbury, Owner of the properties.

In submitting this BID, the BIDDER acknowledges that:

1. Each lump sum price includes all labor, materials, transportation, hauling, overhead, fees and insurances, profit, and all other costs to cover the finished work called for regarding the specified section of Town as stated in the Contract Documents. No additional payment of any kind in the form of a surcharge will be made for work accomplished under the lump sum prices, as bid.
2. No representation of warranty has been made by the OWNER that the estimated quantities used for comparison of BIDS will even approximate the actual quantities required to satisfactorily complete the WORK required under this CONTRACT.
3. Upon receipt of written notice of acceptance of this BID by the OWNER, the BIDDER shall execute the CONTRACT attached to these documents within ten (10) calendar days and other documents as required in these documents.
4. In regard to all conditions affecting the WORK to be done and the labor and materials to be furnished, this BID is based solely on the BIDDER'S investigations and findings and neither the OWNER nor its officers, employees or agents shall be held responsible for the accuracy of, or be bound by any information contained in these Contract Documents.

Submitted By: _____
Company *Phone*

Street *City* *Zip*

Authorized Signature: _____
Signature *Printed Name*

BID FORM
SIMSBURY WWTP RESTORATION OF PRIMARY
CLARIFIERS PROJECT

ITEM NO.	SPEC. SECTION	ITEMS OF WORK	UNIT	ESTIMATED QUANTITIES	BID UNIT PRICE	EXTENDED AMOUNT
1		RESTORATION PRIMARYCLARIFIERS – for furnishing all labor, materials, and equipment and performing all operations required to complete the project as specified	LS	1		
				TOTAL BID:		
					<u>AUTHORIZED SIGNATURE</u> 	

* The number given is the clause number in the Specifications which defines the payment for the ITEM

** The Bidder is requested to fill in computed "Amount": In cases of discrepancy between Unit Prices Bid written in words and the Unit Prices Bid written in figures, the Unit Prices Bid written in words will govern. In case of a discrepancy between the unit prices bid and amount, the Unit Prices will govern.

IF A SOLELY OWNED COMPANY:

Company Name _____
Address _____
Town _____
By _____
(Authorized Signature)
Title _____ Date _____

IF A CORPORATION OR LIMITED LIABILITY COMPANY:

A corporation or limited liability company organized under the laws of

_____, composed of officers as follows:

_____ President	_____ Secretary
_____ Vice President	_____ Treasurer

IF A PARTNERSHIP:

A partnership doing business under the firm name and style of

_____, composed of partners as follows:

_____ Name & Title (if any)	_____ Name & Title (if any)
_____ Name & Title (if any)	_____ Name & Title (if any)

This Bill must bear the written signature of the BIDDER. If the BIDDER is a partnership, the Bid must be signed by a partner. If the BIDDER is a corporation or limited liability company, the Bid must be signed by a duly authorized officer of such corporation or Limited Liability Company.

BIDDER'S QUALIFICATIONS STATEMENT

The BIDDER shall answer all of the following questions, as part of the Bid, so that the OWNER can judge the BIDDER's ability, experience and facilities for performing the proposed work.

1. Name of BIDDER: _____
2. Bidder's Tax Identification Number: _____
3. What year was company organized/formed? _____
4. How many years has the BIDDER been engaged in business under the present firm or trade name? _____
5. What is the general character or type of work you perform? _____

6. Has a claim ever been brought in court or to arbitration against the BIDDER for failure to complete any contracted work or default on a contract? _____
If yes, explain with whom and why: _____

7. For other similar projects you have under contract at the present time: Attach list with description of work; the name of the client/owner with telephone number; and the approximate value of the work to be performed.

NOTE: The BIDDER is required to have completed a minimum of five (5) similar projects as a demonstration of competency and experience for the project proposed herein. Such projects are to be listed below.

8. Attach a list of all projects that your present organization has completed within the past ten years or is presently working on, including name of project, owner and name and telephone number of the owner's representative. Indicate here how many additional pages attached: _____ pages.
9. Attach a list of the names, addresses and the background/experience of all principal or key members of the BIDDERS organization, including its officers:

Indicate the number of pages attached: _____ pages

NOTE: If requested, the BIDDER agrees to furnish the OWNER with a detailed financial statement and other relevant information that may be required by the Town of Simsbury to properly evaluate the qualifications of the BIDDER.

Simsbury WWTP Restoration Primary Clarifier Project,

PROPOSED SUBCONTRACTORS

BIDDER intends to utilize the following subcontractors on this project:

If none, write "None" here: _____

<u>NAME AND ADDRESS OF SUBCONTRACTOR</u>	<u>DESCRIPTION OF WORK:</u>
--	-----------------------------

1.	_____
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2.	_____
----	-------

3.	_____
----	-------

4.	_____
----	-------

5.	_____
----	-------

6.	_____
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NON-COLLUSION AFFIDAVIT OF BIDDER

State of _____, County of _____, being first
duly sworn, disposes and says that:

1. He is the owner, officer, representative or agent of: _____ the
BIDDER that has submitted the attached BID;
2. The attached BID is genuine; it is not a collusive or sham BID.
3. He is fully informed respecting the preparation, and contents of, and knowledgeable of all pertinent
circumstances respecting the attached BID.
4. Neither BIDDER nor any of its officers, partners, owners, agents, representatives, employees, or
parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed,
directly or indirectly, with any other bidder, firm or person to submit a collusive or sham BID in
connection with the AGREEMENT for which the attached BID has been submitted or to refrain
from bidding in connection with any contract, or has in any manner, directly or indirectly, sought
by agreement, collusion, communication or conference with any other bidder, firm or person to fix
the price or prices in the attached BID or of any other bidder, or to fix any overhead, profit or cost
element of the BID prices or the bid price of any other bidder, or to secure through collusion,
conspiracy, connivance or unlawful agreement any advantage against the Town of Simsbury or
any other person interested in the proposed AGREEMENT.
5. The price(s) quoted in the attached BID are fair and proper and are not tainted by any collusion,
conspiracy, connivance or unlawful agreement on the part of the BIDDER or any of its agents,
representatives, owners, employees, or parties in interest, including this affiant; and
6. That no elected or appointed official or other officer or employee of the Town of Simsbury, who
is directly or indirectly interested in this BID, or in the supplies, materials, equipment, work or
labor to which it relates, or in any of the profits thereof.

(Signed) _____

(Name of Bidder)

Subscribed and sworn to before me this
_____ Day of _____, 20__

Title
My Commission expires _____, 20__

Simsbury WWTP Restoration Primary Clarifier Project,

TOWN OF SIMSBURY

**Acknowledgement Form
and
Charter Section 1103
Code of the Town of Simsbury**

ACKNOWLEDGEMENT FORM

I have read Chapter 13 of the Charter of the Town of Simsbury, the Code of Ethics Ordinance, and the Guidelines issued thereunder. I understand my responsibilities as a Contractor retained by the Town of Simsbury, and I am in compliance with the Charter and the Code of Ethics. I have indicated in the space below any areas of conflict should they arise in matters before our board, commission, agency or department, and I agree to report any future conflicts under the provisions of Section 1103 of the Charter.

Areas of Exception

**CONFLICTS OF INTEREST
SECTION 1103**

CONFLICTS OF INTEREST. It is hereby declared to be the policy of the Town that any elected or appointed officer, any member of any board or commission or any employee of the Town who has a financial interest, direct or indirect, in any contract, transaction or decision of any officer or agent of the Town or any board or commission, shall disclose that interest to the Board of Selectmen, which shall record such disclosure upon the official record of its meetings. Such disclosure of a financial interest, direct or indirect, in any contract, transaction or decision of any officer or agent of the town or of any board or commission shall disqualify such elected or appointed official or such member of a board of commission or such town employee from participation in the awarding, assignment or discussion of said contract, transaction or decision. Violation by any such official, board or commission member or employee of the provisions of this section shall be grounds for his/her removal.

Signature

Name (Please Print)

Date

A copy of the Town Code is available from the Office of the Town Clerk or is available on line at
<https://ecode360.com/SI1160>

Simsbury WWTP Restoration Primary Clarifier Project,

**STATEMENT OF BIDDERS COMPLIANCE WITH
EQUAL EMPLOYMENT OPPORTUNITY LAW AND
REGULATION INCLUDING EXECUTIVE ORDER NO. 3**

This statement must be completed by the Bidder and shall accompany his bid for this project.

IT IS HEREBY CERTIFIED THAT:

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

To the extent required by law, the Bidder has complied on past Contracts and will fully comply on this project with all applicable laws and regulation regarding equal employment opportunities for minorities and women, and;

Has _____ has not _____ previously performed work under the conditions of the Governor's

Executive Order No. 3 of the State of Connecticut, or any preceding similar Executive Order with regards to Non-Discrimination.

Signature

Title

Subscribed and sworn to before me this
_____ Day of _____, 20__

Title

My Commission expires _____, 20__

IMPORTANT: THIS STATEMENT MUST BE SUBMITTED WITH BID

END OF SECTION

Simsbury WWTP Restoration Primary Clarifier Project,

BID BOND

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

BID DUE DATE: _____

PROJECT (Brief Description Including Location):

BOND

BOND NUMBER: _____

DATE (Not later than Bid due date): _____

PENAL SUM: _____

(Words)

(Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

(Seal)

Bidder's Name and Corporate Seal

(Seal)

Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1. OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by OWNER, or
 - 3.3. OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power or Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
10. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

**SIMSBURY WWTP RESTORATION OF PRIMARY
CLARIFIERS PROJECT**

**STANDARD CONTRACT DOCUMENTS FOR
THE TOWN OF SIMSBURY**

CONTRACT AGREEMENT

TOWN OF SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS PROJECT

THIS AGREEMENT, made this ____ day of _____ by and between THE TOWN OF SIMSBURY, 933 Hopmeadow Street, Simsbury, Connecticut hereinafter referred to as the OWNER and WINNING BIDDER with an address at ADDRESS OF WINNING BIDDER hereinafter referred to as the CONTRACTOR

WITNESSETH:

That for and in consideration of the mutual covenants and promises between the parties hereto, it is hereby agreed that:

1. The CONTRACTOR will furnish all of the materials and supplies, equipment, and labor and other services necessary in conformance with these contract documents for the construction and completion of the project described in general as follows: Simsbury WWTP Restoration of Primary Clarifiers Project, as defined in the Standard Instruction for Bidders.
2. COMPLETION OF WORK. The Contractor shall commence the work covered by this contract within ten (10) calendar days after the date of receipt of the Notice to Proceed and shall complete the same within _____ calendar days unless the period for completion is extended as provided for in the General Conditions.
3. CONTRACT SUM. The Owner shall pay the Contractor for the performance of said work the sum of \$_____, subject to additions or deductions provided herein in conformity with the bid schedule of prices.
4. The Contract Documents include the following:
 - (a) Notice and Instructions to Bidders dated _____
 - (b) Bidder's Bid Form dated _____
 - (c) Addenda acknowledged on the Bidder's Bid Form
 - (d) Notice of Award dated _____
 - (e) Notice to Proceed dated _____
 - (f) This Contract Agreement

- IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Contract in duplicate, on the date first above written.

Signed, Sealed and Delivered
in the presence of:

Title: _____

**PROJECT: SIMSBURY WWTP RESTORATION OF PRIMARY
CLARIFIERS PROJECT**

**Information Needed for
Communications on the Project**

Name of Company:

Location of Company Office:

Street

City/State

Zip Code

Mailing Address of Company Office (if different than location):

Street

City/State

Zip Code

Phone No. of Company's Office (include area code):

Phone No. of Company's Project Office (if applicable):

Company Official Responsible for this Project:

Name

Title

Phone No. ()

Project Supervisor or Foreman:

Name

Phone No. ()

Person to be Contacted in Emergencies after Work Hours:

Name

Phone No. ()

Person to be Contacted in Emergencies on Weekends and Holidays:

Name

Phone No. ()

If any changes to the above information occur during the progress of the work, the Public Works Director shall be immediately notified.

Town of Simsbury

SUPPLEMENTAL CONTRACT SECTION

CODE OF ETHICS

Chapter 13 of the Code of Ordinances, the Simsbury Code of Ethics, is hereby incorporated by reference as if fully set forth, and is made a part of the Contract Documents. All Contractors shall sign the Acknowledgement Form.

TOWN OF SIMSBURY

Acknowledgement Form and Charter Section 1103 Code of the Town of Simsbury

ACKNOWLEDGEMENT FORM

I have read Section 1103 of the Charter of the Town of Simsbury, the Code of Ethics Ordinance, and the Guidelines issued thereunder. I understand my responsibilities as a Contractor retained by the Town of Simsbury, and I am in compliance with the Charter and the Code of Ethics. I have indicated in the space below any areas of conflict should they arise in matters before our board, commission, agency or department, and I agree to report any future conflicts under the provisions of Section 1103 of the Charter.

Areas of Exception

CONFLICTS OF INTEREST SECTION 1103

CONFLICTS OF INTEREST. It is hereby declared to be the policy of the Town that any elected or appointed officer, any member of any board or commission or any employee of the Town who has a financial interest, direct or indirect, in any contract, transaction or decision of any officer or agent of the Town or any board or commission, shall disclose that interest to the Board of Selectmen, which shall record such disclosure upon the official record of its meetings. Such disclosure of a financial interest, direct or indirect, in any contract, transaction or decision of any officer or agent of the town or of any board or commission shall disqualify such elected or appointed official or such member of a board of commission or such town employee from participation in the awarding, assignment or discussion of said contract, transaction or decision. Violation by any such official, board or commission member or employee of the provisions of this section shall be grounds for his/her removal.

Signature

Name (Please Print)

Date

CONTRACTOR'S EXEMPT PURCHASE CERTIFICATE

I hereby certify, under penalties of perjury, that I am engaged in the performance of a construction contract on a project for the following named exempt agency or organization:

Town of Simsbury

Full Name of Agency of Organization

**933 Hopmeadow Street
Simsbury, CT. 06070**

Address of Same

That such agency is, to the best of my knowledge and belief, exempt from the Sales and Use Tax because it is a

Town

(Town, School, Fire or Police Department, Library etc.,
or other branch of State or Federal Government)

In accordance with Regulation No. 16 of Sales and Use Tax.

That this certificate is issued to cover all purchases of materials and supplies, designated by me, for use of the project referred to above.

Permit No. (if any) (signed)

Contractor

Date:

Place:

Firm Name

Address:

GENERAL CONDITIONS

1. DEFINITIONS

- 1.1 Wherever used in the CONTRACT DOCUMENTS, The following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof.
- 1.2 ADDENDA - Written or Graphic Instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Drawings and Specifications, by additions, deletions, clarifications or corrections.
- 1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.
- 1.4 BIDDER - Any person, firm, or corporation submitting a BID for the WORK.
- 1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR in accordance with the CONTRACT DOCUMENTS.
- 1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT TIME.
- 1.7 CONTRACT DOCUMENTS - The contract including Advertisement for Bids, information for Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, AND ADDENDA.
- 1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.
- 1.9 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
- 1.10 CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.
- 1.11 DRAWINGS - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.
- 1.12 ENGINEER - Tighe & Bond.

- 1.13 FIELD ORDER - A written order affecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.
- 1.14 CONSTRUCTION OBSERVER - The ENGINEER appointed by the Town of Simsbury, Conn. to observe the work and to check that the work has been performed in general conformance with the CONTRACT DOCUMENTS.
- 1.15 NOTICE OF AWARD - The written notice of the acceptance of the Bid from the OWNER to the successful BIDDER.
- 1.16 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him/her to proceed with the WORK and establishing the date of commencement of the work.
- 1.17 OWNER - The Town of Simsbury, Connecticut (A Public Body) for whom the WORK is to be performed.
- 1.18 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.
- 1.19 SHOP DRAWINGS - All Drawings, Diagrams, Illustrations, Brochures, Schedules, and other data which are prepared by the CONTRACTOR, A SUBCONTRACTOR, manufacturer SUPPLIER or Distributor which illustrate how specific portions of the WORK shall be fabricated or installed.
- 1.20 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.
- 1.21 SUBCONTRACTOR - An individual firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the work at the site.
- 1.22 SUBSTANTIAL COMPLETION- That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.
- 1.23 SUPPLEMENTAL GENERAL CONDITIONS - Special provisions required by the funding program or Agency (Federal, State, or Local) for participation in the PROJECT and included in the CONTRACT DOCUMENTS. Also such requirements that may be imposed by

Applicable State Laws and special characteristics of the PROJECT.

- 1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.
- 1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, all construction tools, machinery, and equipment, and all materials and equipment incorporated or to be incorporated in the PROJECT.
- 1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by Mail to the said party at his/her last given address or delivered in person to said party or his/her authorized representative on the WORK.

2. PAYMENT

- 2.1 On the first of each month, the Contractor may submit an itemized estimate of work completed up to that time, including an estimate of the portion of lump sum items completed.
He/she must, if requested by the Engineer, submit satisfactory evidence that he/she has paid in full for all labor, materials and equipment included in the monthly estimate. The estimates shall be made on forms furnished by the Town and the Contractor shall certify that the estimate is correct and the work performed is in conformity with the plans and specifications. No later than 31 days after submission by the Contractor, and acceptance by the Town, of the estimate, the Town will pay the estimated cost, less five percent (5%) retained by the Town.

After completion of the project and acceptance by the Town, the Contractor shall submit an itemized final estimate. No later than 31 days after acceptance of the final estimate by the Town, the Town shall pay ninety-five (95%) percent of the Contract price. No later than six months after acceptance of the final estimate the Town will pay the five (5%) retained, unless in that time the materials or workmanship in the project shall have been found to be defective.

3. PERMITS DURATION

- 3.1 The Contractor must obtain all necessary permits and pay the fee for them. (Town portion of permit fees are waived. The State of Connecticut portion of building permits will not be waived.)
- 3.2 Should the Town be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any

litigation or other reason beyond the control of the Town, the Contractor shall not be entitled to or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

4. OBSERVATION

- 4.1 The Town will be represented at all times by the TOWN DIRECTOR OF PUBLIC WORKS or an employee authorized by the TOWN DIRECTOR OF PUBLIC WORKS to represent him/her; and the DIRECTOR OF PUBLIC WORKS or his/her authorized representative shall have sole authority in the interpretation and execution of the contract.
- 4.2 The Contractor must have a competent Field Supervisor on the job during all working hours and notify the Town of his/her name and address in writing, and where he/she may be reached normally after working hours. In the event of the absence of the Field Supervisor, the Contractor must appoint a second in command to take responsible charge of the job. The actual performance of work and superintendence shall be performed by the Contractor but the owner shall, at all times, have access to the premises for the purpose of observing or inspecting the work performed by the Contractor.

5. SITE WORK

- 5.1 The Contractor will be responsible for maintenance of adequate barricades, signs, and warning systems to protect the job and the public.
- 5.2 The Contractor shall properly protect all underground and above ground utilities from damage. No interruption shall be caused to any utility without the knowledge of the TOWN DIRECTOR OF PUBLIC WORKS.
- 5.3 Contractor will maintain site in a clean and professional manner. Contractor will clean area of work at the end of the day including sweeping adjacent pavement.
- 5.4 Contractor will use standard dust control methods when requested by the Engineer.
- 5.5

6. STANDARDS

- 6.1 Whenever a material, article, or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard and, any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Town Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor without written approval.

7. CHANGES IN WORK

- 7.1 The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly.

8. CORRECTION OF WORK AFTER FINAL PAYMENT

- 8.1 Neither the final Certificate nor payment nor any provision in the Contract Documents shall relieve the contractor of responsibility for faulty materials or workmanship and, unless otherwise specified, he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of substantial completion.
- 8.2 The Owner shall give notice of observed defects with reasonable promptness. All questions arising under this article shall be decided by the DIRECTOR OF PUBLIC WORKS subject to mediation.

9. INSURANCE REQUIREMENTS

The Contractor must carry the following types of insurance under which the Town and Engineer are named as an additional insured on a primary and non-contributory basis, as follows:

Such insurance must be by insurance companies licensed to write such insurance in Connecticut against the following risks with the following minimum amounts and minimum durations.

A. Workman's Compensation, as required by Connecticut State Statute.
Employer's Liability: at least \$100,000 per employee/ \$100,000 per incident, and \$500,000 per policy.

Public Liability, Bodily Injury Liability and Property Damage Liability as follows:

Injury or death of one person:	\$2,000,000
Injury to more than one person in a single accident:	\$1,000,000
Property damage in one accident:	\$1,000,000
Property damage in all accidents:	\$1,000,000

B. Automobile (including owned, hired, non-owned) and Truck (Vehicular) Public Liability, Bodily Injury Liability, and Property Damage Liability as follows:

Injury or death of one person:	\$1,000,000
Injury to more than one person in a single accident:	\$1,000,000
Property damage in one accident:	\$1,000,000
Property damage in all accidents:	\$1,000,000

C. Builders Risk including Fire and Extended coverage:
In an amount equal to the value of construction completed plus materials delivered to the site.

Insurance under B and C above must provide for a 30 day notice to the Town of cancellation/or restrictive amendment.

Insurance under B and C above must be for the whole duration of the contract and for at least twenty-four (24) months after acceptance of the project by the Town.

A waiver of subrogation is required in favor of the Town of Simsbury on all insurance policies, including workers' compensation.

Subcontractors must carry A, B and C in at least the same amounts as above for the duration of the project and until acceptance by the Town.

Certificates of insurance must be submitted to the Director of Public Works, with copies to Weston & Sampson, prior to the signing of the contract and within ten days of notification of award of contract. Should any insurance expire or be terminated during the period in which the same is required by this contract, the Director of Public Works shall be notified and such expired or terminated insurance must be replaced with new insurance and a new certificate furnished to the Director of Public Works.

Failure to provide the required insurance and certificates may, at the option of the Town, be held to be a willful and substantial breach of this contract.

NOTE: Coverage under "B" shall include XCU coverage as necessary, Collapse and Underground shall be provided for ALL Contracts. Explosion will be provided if specified, or prior to any blasting being performed under the Contract.

Indemnification: To the fullest extent permitted by law, Contractor shall defend, indemnify and hold harmless the Town of Simsbury and ENGINEER from and against all claims, bodily injury and property damage, judgments and expenses, including attorney fees, that arise from and are alleged to arise from the performance of this Agreement. This provision shall survive termination of this Agreement.

10. OWNER'S RIGHT TO DOWORK

If the Contractor fails to prosecute the work properly or fails to perform any provisions of this contract, the Owner, after three days written notice to the Contractor may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Provided, however, that the Public Works Director shall approve both such action and the amount charged to the Contractor.

11. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

12. CONTRACT SECURITY

The Contractor shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a performance BOND and a payment BOND in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions, and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and shall be in a

Form acceptable to the Town Director of Finance. When Surety Company Bonds are used, the corporate bonding company shall be licensed to transact such business in the State of Connecticut and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such bond is declared as bankrupt or loses its right to do business in the State in which the WORK is to be performed or is removed from the list of surety companies accepted on FEDERAL BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the CONTRACTOR shall have furnished an acceptable BOND to the OWNER.

13. ASSIGNMENT

Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the CONTRACT or any portion thereof, or of his/her right title or interest therein, or his obligations there under, without written consent of the other party.

14. DRAWINGS AND SPECIFICATIONS

- 14.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner ready for use, occupancy, or operation by the OWNER.
- 14.2 In case of conflict between the DRAWINGS AND SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.
- 14.3 Any discrepancies found between the DRAWINGS AND SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his/her discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

- 14.4 The OWNER will furnish free of charge to the contractor up to three (3) copies of the DRAWINGS and SPECIFICATIONS as necessary for the proper execution of the WORK.

15. MATERIALS, WORKMANSHIP, SERVICES, AND FACILITIES

- 15.1 It is understood that except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, tools, equipment, sanitary conveniences, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.
- 15.2 All materials furnished shall be new and of the best quality customarily used in or furnished for work of the character of that herein proposed. Many features of the proposed work are described in detail herein, but the failure to so describe any part of the proposed work or any details or appurtenance thereof shall not be an exception to the above rule. The absence of requirements in drawings or specifications covering details usually included in first class installations of this kind shall not excuse the contractor for their omission in this work.
- 15.3 All workmanship shall be of the best quality for WORK of the character of that herein proposed. The CONTRACTOR shall employ only competent employees to do the WORK required.
- 15.4 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.
- 15.5 Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.
- 15.6 Drinking water furnished for the employees on the job shall comply with O.S.H.A. regulations.

16. PROTECTION OF WORK AND PROPERTY

- 16.1 The CONTRACTOR will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK--he/she will take all necessary precautions for the

safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the site and other persons who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

- 16.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. He/she will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He/she will notify owners of adjacent utilities when prosecution of the work may affect them. The CONTRACTOR will remedy all damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, and SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or the acts or omissions, of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.
- 16.3 The CONTRACTOR will notify the OWNER at least one week prior to the start of construction.
- 16.4 The CONTRACTOR shall be responsible for verifying the location of any existing utilities. The CONTRACTOR shall notify "Call Before You Dig" at 1-800-922-4455 such that any utility lines can be marked.
- 16.5 In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He/she will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

17. CHANGES IN CONTRACT PRICE

The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

- (a) Unit prices previously approved

- (b) An agreed lump sum
- (c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

18. TIME FOR COMPLETION

- 18.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.
- 18.2 The CONTRACTOR will proceed with the work at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.
- 18.3 If the CONTRACTOR is delayed at any time in the progress of the WORK by changes ordered in the WORK, by labor disputes, fire, unusual delay in transportation, unavoidable casualties, causes beyond the CONTRACTOR'S control, or by any cause which the ENGINEER may determine justifies the delay, then the CONTRACT TIME shall be extended by CHANGE ORDER for such reasonable time as the ENGINEER may determine.

19. SUSPENSION OF WORK, TERMINATION AND DELAY

- 19.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days, or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which work shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.
- 19.2 If the CONTRACTOR is adjudged as bankrupt or insolvent, or if he/she makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he/she files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he/she repeatedly fails to supply sufficient skilled workmen or

suitable materials or equipment, or if he/she repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials, or equipment or if he/she disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he/she disregards the authority of the ENGINEER, or if he/she otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his/her surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment, and machinery thereon owned by the CONTRACTOR and finish the WORK by whatever method he/she may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished.

If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

- 19.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.
- 19.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.
- 19.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within (30) days of its approval and presentation, then the Contractor may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for

all WORK executed to date. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon Ten (10) Days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK. In no event shall Contractor be entitled for costs and expenses for work not yet completed.

- 19.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

20. INDEMNIFICATION

- 20.1 The CONTRACTOR will defend and hold harmless the OWNER and ENGINEER and their agents and employees from and against all Claims, Damage, Loss, or Expense including Attorney's fees arising out of or resulting from the performance of the WORK, provided that any such Claims, Damage, Loss or Expense is attributed to Bodily Injury, Sickness, Disease or Death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
- 20.2 In any and all claims against the OWNER, ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR or SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the INDEMNIFICATION OBLIGATION shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under Workmen's Compensation Acts, Disability Benefit Acts or other Employee Benefits Acts.
- 20.3 The obligation of the CONTRACTOR under this paragraph shall

not extend to the liability of the OWNER, ENGINEER, or any of their agents or employees arising out of the preparation or approval of MAPS, DRAWINGS, Opinions, Reports, Surveys, CHANGEORDERS, Designs, or SPECIFICATIONS.

21. SEPARATE CONTRACTS

- 21.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR's WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.
- 21.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other Contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are Parties to such CONTRACTS (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.
- 21.3 If the performance of Additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a Claim therefore as provided in Sections 22 and 23.

22. SUBCONTRACTING

- 22.1 The CONTRACTOR may utilize the services of Specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by Specialty CONTRACTORS.
- 22.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s) in excess of Fifty (50) Percent of the CONTRACT PRICE, without prior written approval of the OWNER.

- 22.3 The CONTRACTOR shall be fully responsible to the OWNER for the Acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by him.
- 22.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS, as applicable to the WORK OF SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise of the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.
- 22.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

23. GUARANTY

The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the PROJECT that the completed PROJECT is free from all defects due to faulty materials or WORKMANSHIP and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the PROJECT resulting from such defects. The

OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The PERFORMANCE BOND or a MAINTENANCE BOND shall remain in force at a value of 25% of the completed WORK through the GUARANTEE PERIOD.

24. DISPUTE RESOLUTION

- 24.1 All claims, disputes and other matters in questions arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of Final Payment as provided by Section 16, shall be decided by Arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing Connecticut Arbitration law.
- 24.2 Notice of the Demand for Arbitration shall be filed in writing with the

Other Party to the CONTRACT DOCUMENTS and with the American Arbitration Association, and a copy shall be filed with the Engineer. The Demand for Arbitration shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable Statute of Limitations.

- 24.3 The CONTRACTOR will carry on the WORK and maintain the Progress Schedule during any Mediation proceedings, unless otherwise mutually agreed in writing.

25. TAXES

The CONTRACTOR will pay all consumer, use, and other similar taxes required by the Law of the Place where the WORK is performed. This WORK is being performed for a Municipal Government and is exempt from Sales Tax.

SUPPLEMENTAL GENERAL CONDITIONS

1. PA 86-87, AAC Workers' Compensation Insurance Requirements for Contractors on Public Works projects and State licenses, prohibits municipalities from entering into a public works contract with an employer without receiving sufficient evidence from the employer that he has workers' compensation insurance and a statement from the state treasurer that the employer does not owe the Second Injury and Compensation Assurance Fund any money.
2. The Town of Simsbury Public Works Department shall be notified at least five (5) days prior to beginning work.
3. Prior to beginning work, the "Call Before You Dig" service shall be notified by the Contractor by calling 811 or 1-800-922-4455, or, if the contractor is registered, by e-ticket entry, such that any underground utilities in the immediate vicinity of the work can be marked.
4. All staking and surveying will be the responsibility of the Contractor.
5. Sales and Use Tax Exempt Purchase Certificate/ The Contractor's attention is called to Regulation 18 as amended promulgated by the Sales and Use Tax Division of the State Tax Department, which provided for the Exemption of the sales and use tax on the purchase of such materials and supplies as are to be physically incorporated in and become a permanent part of the project being performed under this contract. The Contractor or Subcontractor shall furnish his suppliers with a completed certificate, in the prescribed form; a copy of which is attached to these specifications
6. Upon completion or termination of the work, the Contractor shall remove from the vicinity of the work all equipment and all temporary structures, waste materials and rubbish resulting from its operations, leaving the premises in a neat and acceptable condition. In the event of failure to do so, the same may be done by the Owner at the expense of the Contractor.
7. The Contractor shall pay for any broken utility lines, except where the utility company may be liable under the "Call Before You Dig" law. The Owner will only pay for relocations necessary to complete the work of this project.
8. In accordance with Executive Order 11246, the Contractor is obliged not to discriminate against any employee or applicant for employment because of race, color, creed, or national origin. This obligation not to discriminate in employment includes, but is not limited to, the following: hiring, placement, upgrading, transfer, demotion, recruitment, advertising, solicitation for employment training during employment, rates of pay or other forms of compensation, selection for training including apprenticeship, layoff, or
9. termination.
10. For all new underground facilities installed after January 1, 1989 which is practicable and for all repairs, replacements or modifications involving an exposure of existing

underground facilities at least 100 feet longitudinally after January 1, 1989, of which the utility has knowledge of such exposure, the utility shall install a warning tape located above the facility, and keep appropriate records thereof. The minimum separation between the facility and the warning tape shall be 12 inches unless the depth, other underground facilities or other engineering considerations make the minimum separation infeasible. The warning tape shall be durable, designed to withstand extended underground exposure, be of color assigned to the type of facility for surface markings in Section 16-345-5 (h) and durable imprinted with an appropriate warning or message.

11. Comply with the Special Provisions which are attached to these Supplemental General Conditions
12. Comply with the state of Connecticut Wage Rates which are attached to these Supplemental General Conditions.

SPECIAL PROVISIONS

1. **Cleaning Up:** The Contractor shall at all times keep the site and work free from accumulations of waste material or rubbish caused by his employees or work, or the employees or work of any of his subcontractors.

On completion of the work, the Contractor except as otherwise expressly directed or permitted in writing, shall tear down and remove all temporary structures built by him; shall remove all rubbish and abandoned materials of all kinds from all Contract structures and from any grounds, and shall leave all the grounds which may have been affected by his/her operations in a neat and satisfactory condition. Except as noted, all materials salvaged shall be the property of the Contractor.

2. **Materials Testing:** The owner reserves the right to engage the services of a third party testing or engineering company to oversee all or part of the work to be done. These services will be scheduled and paid for by the owner. The contractor will provide testing or engineering firm with resources necessary to complete their work.
3. **Act, Or Failure To Act, On Part Of Engineer Does Not Reduce Liability Of Contractor:** Giving notice or failure to give notice; or acting as authorized in the preceding sections, or failure to so act, on the part of the Engineer; or any question as to the adequacy of the notice by the Engineer, or of his/her acts, as provided in those sections, shall not in any way relieve the Contractor from any part of his responsibility or liability for performing any and all of the acts and assuming any and all of the risks, duties and liabilities which the Contractor is obligated to perform or assume.
4. **Disposal of Surplus Materials:** The Contractor shall be responsible for the removal and satisfactory disposal of all surplus materials unless otherwise specified in the Detail Specifications. Town properties shall not be used for such disposal unless specifically authorized by the Engineer in writing. Property owners adjacent to the work may have indicated to the Town that their land might be available for disposal of surplus fill and this fact may be noted on the Contract Drawings. The Contractor shall, however, make his own arrangements for the use of such private lands and shall, if requested by the Engineer, evidence that such arrangements have been made before such use. Any required local permits shall be the responsibility of the Contractor.
5. **Utility Notification Prior to Excavation:** In accord with Public Act 77-350, the Contractor is required to notify any utility with facilities in the vicinity of the excavation at least two full days prior to excavation. Notification may be given by using the "Call Before You Dig" state wide, toll free telephone number, 811 or 1-800-922-4455., or if the contractor is registered, by e-ticket entry. Responsibility for proper notification of all utilities shall rest with the Contractor.

The Contractor shall contact the appropriate Town authorities concerning any public or semi- public events that may occur during the construction period and that may have an effect on his construction. The contractor alone shall be responsible for

arranging his construction sequence to conform to any restrictions these events may impose on his schedule.

No claims for extras will be allowed because of any delays, caused by the imposed restrictions; however, additional time may be granted for completion of the work to compensate for any delays caused by said restrictions.

6. **The State of Connecticut, Department of Environmental Protection and other involved State agencies** shall have access and inspection rights to all parts of the work on this project.
7. **Quantities of work** may be increased or decreased by up to 50% with payment to be based on actual quantities of work completed and the bid unit prices.
8. **Conflicts with Sidewalk** will immediately be brought to the attention of the Director of Public Works, or a designated representative. The decision on how to proceed will be at the sole discretion of the Director of Public Works.

SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS PROJECT

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

Holding place

Minimum Rates and Classifications for Heavy/Highway Construction

Connecticut Department of Labor

Wage and Workplace Standards Division

ID#: H 26346

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Town	Classification	Hourly Rate	Hourly Benefit
Simsbury	1) Boilermaker	\$33.79	34% + 8.96
Simsbury	1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	\$34.72	32.15
Simsbury	2) Carpenters, Piledrivermen	\$33.53	25.66
Simsbury	2a) Diver Tenders	\$33.53	25.66
Simsbury	3) Divers	\$41.99	25.66
Simsbury	03a) Millwrights	\$34.04	26.09
Simsbury	4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	\$49.75	21.05
Simsbury	4a) Painters: Brush and Roller	\$33.62	21.05
Simsbury	4b) Painters: Spray Only	\$36.62	21.05
Simsbury	4c) Painters: Steel Only	\$35.62	21.05
Simsbury	4d) Painters: Blast and Spray	\$36.62	21.05
Simsbury	4e) Painters: Tanks, Tower and Swing	\$35.62	21.05
Simsbury	5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V- 1,2,7,8,9)	\$40.00	27.67+3% of gross wage
Simsbury	6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	\$36.67	35.77 + a

Town	Classification	Hourly Rate	Hourly Benefit
Simsbury	7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S- 1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	\$43.62	32.06
Simsbury	----LABORERS-----		
Simsbury	8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	\$30.75	20.84
Simsbury	9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	\$31.00	20.84
Simsbury	10) Group 3: Pipelayers	\$31.25	20.84
Simsbury	11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	\$31.25	20.84
Simsbury	12) Group 5: Toxic waste removal (non-mechanical systems)	\$32.75	20.84
Simsbury	13) Group 6: Blasters	\$32.50	20.84
Simsbury	Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	\$31.75	20.84
Simsbury	Group 8: Traffic control signalmen	\$18.00	20.84
Simsbury	Group 9: Hydraulic Drills	\$29.30	18.90
Simsbury	----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
Simsbury	13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	\$32.98	20.84 + a
Simsbury	13b) Brakemen, Trackmen	\$32.01	20.84 + a
Simsbury	----CLEANING, CONCRETE AND CAULKING TUNNEL----		
Simsbury	14) Concrete Workers, Form Movers, and Strippers	\$32.01	20.84 + a
Simsbury	15) Form Erectors	\$32.34	20.84 + a
Simsbury	----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

Town	Classification	Hourly Rate	Hourly Benefit
Simsbury	16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	\$32.01	20.84 + a
Simsbury	17) Laborers Topside, Cage Tenders, Bellman	\$31.90	20.84 + a
Simsbury	18) Miners	\$32.98	20.84 + a
Simsbury	----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: - ---		
Simsbury	18a) Blaster	\$39.47	20.84 + a
Simsbury	19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	\$39.27	20.84 + a
Simsbury	20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	\$37.29	20.84 + a
Simsbury	21) Mucking Machine Operator	\$40.06	20.84 + a
Simsbury	----TRUCK DRIVERS----(*see note below)		
Simsbury	Two axle trucks	\$29.51	24.52 + a
Simsbury	Three axle trucks; two axle ready mix	\$29.62	24.52 + a
Simsbury	Three axle ready mix	\$29.67	24.52 + a
Simsbury	Four axle trucks, heavy duty trailer (up to 40 tons)	\$29.72	24.52 + a
Simsbury	Four axle ready-mix	\$29.77	24.52 + a
Simsbury	Heavy duty trailer (40 tons and over)	\$29.98	24.52 + a
Simsbury	Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	\$29.77	24.52 + a
Simsbury	----POWER EQUIPMENT OPERATORS----		
Simsbury	Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	\$40.97	24.80 + a

Town	Classification	Hourly Rate	Hourly Benefit
Simsbury	Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	\$40.64	24.80 + a
Simsbury	Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	\$39.88	24.80 + a
Simsbury	Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	\$39.48	24.80 + a
Simsbury	Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	\$38.87	24.80 + a
Simsbury	Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	\$38.87	24.80 + a
Simsbury	Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	\$38.55	24.80 + a
Simsbury	Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	\$38.20	24.80 + a
Simsbury	Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	\$37.79	24.80 + a
Simsbury	Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	\$37.34	24.80 + a
Simsbury	Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	\$35.24	24.80 + a
Simsbury	Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	\$35.24	24.80 + a
Simsbury	Group 12: Wellpoint Operator.	\$35.18	24.80 + a
Simsbury	Group 13: Compressor Battery Operator.	\$34.58	24.80 + a
Simsbury	Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	\$33.41	24.80 + a

Town	Classification	Hourly Rate	Hourly Benefit
Simsbury	Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	\$32.99	24.80 + a
Simsbury	Group 16: Maintenance Engineer/Oiler	\$32.32	24.80 + a
Simsbury	Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	\$36.76	24.80 + a
Simsbury	Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	\$34.26	24.80 + a
Simsbury	**NOTE: SEE BELOW		
Simsbury	----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----		
Simsbury	20) Lineman, Cable Splicer, Technician	\$48.19	6.5% + 22.00
Simsbury	21) Heavy Equipment Operator	\$42.26	6.5% + 19.88
Simsbury	22) Equipment Operator, Tractor Trailer Driver, Material Men	\$40.96	6.5% + 19.21
Simsbury	23) Driver Groundmen	\$26.50	6.5% + 9.00
Simsbury	23a) Truck Driver	\$40.96	6.5% + 17.76
Simsbury	----LINE CONSTRUCTION----		
Simsbury	24) Driver Groundmen	\$30.92	6.5% + 9.70
Simsbury	25) Groundmen	\$22.67	6.5% + 6.20
Simsbury	26) Heavy Equipment Operators	\$37.10	6.5% + 10.70
Simsbury	27) Linemen, Cable Splicers, Dynamite Men	\$41.22	6.5% + 12.20
Simsbury	28) Material Men, Tractor Trailer Drivers, Equipment Operators	\$35.04	6.5% + 10.45

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

***Note: Hazardous waste premium \$3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - \$1.50 extra Crane with 200 ft. boom (including jib) - \$2.50
extra Crane with 250 ft. boom (including jib) - \$5.00 extra Crane with 300 ft. boom (including jib) -
\$7.00 extra Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~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 clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

**SIMSBURY WWTP RESTORATION OF PRIMARY CLARIFIERS
PROJECT,**

**INDEX TO
TECHNICAL SPECIFICATIONS**

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Section 01 12 16 – Scope and Sequence of Work

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Section 03 01 30.62 – Repair Existing Concrete Structures

Section 03 03 10 – Concrete Moisture Vapor Reduction Admixture

Section 03 30 00 – Cast-in-Place Concrete for Buildings

Section 05 12 33 – Structural Steel

Section 06 61 00 – Fiberglass Reinforced Plastic Grating

SECTION 01 11 00

CONTROL OF WORK AND MATERIALS

PART 1 – GENERAL

Not Used.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 HAULING, HANDLING AND STORAGE OF MATERIALS:

- A. The Contractor shall, at its own expense, handle and haul all materials furnished by it and shall remove any of its surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by it that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

3.02 OPEN EXCAVATIONS:

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at its own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.
- B. Bridges provided for access to private property during construction shall be removed when no longer required.

- C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.
- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of steel plates of adequate strength to carry traffic shall be used.

3.03 MAINTENANCE OF TRAFFIC:

- A. Unless permission to close the street is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular and pedestrian traffic may be safely maintained at all times.
- B. Should the Chief of Police deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall make all arrangements in obtaining uniformed officers required.
- C. The Contractor shall at its own expense, as directed by the Police Traffic Control/Safety Officer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, and animals. It shall provide sufficient temporary lighting such as lanterns/flashers (electric battery operated) or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner.
- D. The Contractor shall furnish all construction signs that are deemed necessary by and in accordance with Part VI of the Manual on Uniform Traffic Control Devices as published by the U.S. Department of Transportation. In addition, the Contractor may be required to furnish up to 128 square feet of additional special construction warning signs. Size and exact wording of signs shall be determined by the Engineer during construction.
- E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as watchmen to protect the Contractor's equipment and materials.
- F. Nothing contained herein shall be construed as relieving the Contractor of any of its responsibilities for protection of persons and property under the terms of the Contract.

3.04 CARE AND PROTECTION OF PROPERTY:

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at its expense, to

a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

3.05 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

- A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.
- B. The Contractor shall determine the location of all underground structures and utilities (including existing water services, drain lines, electrical lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by Contractor.
- C. When fences interfere with the Contractor's operations, it shall remove and (unless otherwise specified) promptly restored.
- D. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces.
- E. All property damaged by the Contractor's operations shall be restored to a condition at least equal to that in which it was found immediately before work was begun. Suitable materials and methods shall be used for such restoration.
- F. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.

3.06 MAINTENANCE OF FLOW:

- A. The Contractor shall at its own cost, provide for the flow of sewers and drains interrupted during the progress of the work, and shall immediately cart away and dispose of all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.
- B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, it shall repair the same within the same day.
- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by its operations.

3.07 REJECTED MATERIALS AND DEFECTIVE WORK:

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or its employees, as determined by the Engineer, occurring previous to the final payment.

3.08 SANITARY REGULATIONS:

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.

3.09 SAFETY AND HEALTH REGULATIONS:

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Connecticut Department of Labor Division of Occupational Safety and Health (CONN-OSHA). Contractors shall be familiar with the requirements of these regulations.

3.10 SITE INVESTIGATION:

The Contractor acknowledges that it has satisfied itself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint itself with available information will not relieve it from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

3.11 HANGERS, PADS, AND SUPPORTS:

- A. Unless otherwise indicated, hangers and supports shall be by the trade providing the supported item.
- B. Except where detailed or specified, design of hangers and supports shall be the responsibility of the Contractor. All parts of such hangers or supports shall be designed in accordance with accepted engineering practice, using a factor of safety of at least 2½.
- C. When proprietary hangers, etc., are supplied, satisfactory evidence of the strength of such items shall be furnished.
- D. Hangers for items hung from steel and concrete shall be centered on the vertical center of gravity of the beam.
- E. Locations and sizes of openings, sleeves, concrete pads, steel frames, and other equipment supports are indicated on the drawings for bidding purposes only. Final sizes and locations of such items shall be obtained from the shop drawings.

3.12 SLEEVES, HOLES, HANGERS, INSERTS, ETC.:

- A. Except where holes and openings are dimensioned, and hangers, inserts, and supports are fully called for on the architectural and structural drawings (or reference is made thereon to drawings containing such information) to accommodate mechanical or electrical items, they shall be by the mechanical or electrical trade concerned.
- B. Sleeves, inserts, anchors, etc., supplied under the mechanical and electrical contracts in sufficient time to so permit, shall be set in concrete, masonry, etc., or fastened to steel deck, etc., by the respective architectural or structural trade. Where not supplied in sufficient time, installation of such items shall be the responsibility of the mechanical or electrical trade involved.
- C. Nothing shall be suspended from the steel roof deck and no fastenings made to it, except with the prior permission of the Engineer. Request for permission shall be accompanied by full details of the hanger or fastener, including the weight of the item to be suspended.
- D. Nailers and other wood members attached to steel or masonry, for which fasteners are not indicated on the design drawings or in the specification, shall be fastened with the equivalent of ½-inch diameter bolts at 3 feet o.c.
- E. Openings for mechanical and electrical items in finished areas of the building shall be closed off with near escutcheon plates or similar closures. These closures shall be by the mechanical or electrical trade involved.

3.13 ROOF PROTECTION:

Where work must be performed over completed roofing, the roofing shall be protected by 2 layers of ½-inch thick plywood, laid with joints in the second layer offset 1/2 sheet width and length from joints in the first layer. No material shall be stored or work performed on areas of roof which are not so protected.

3.14 WEATHER PROTECTION:

The Contractor shall install weather protection and shall furnish adequate heat in the area so protected during the months of November through March.

3.15 ELECTRIC SERVICE:

- A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. There shall be sufficient electric lighting so that all work may be done in a workmanlike manner where there is not sufficient daylight.

3.16 HAZARDOUS WASTE:

Should the Contractor, while performing work under this contract, uncover hazardous materials, as defined in Connecticut Remediation Standard Regulations, it shall immediately notify the Engineer. The Contractor is not, and has no authority to act as, a handler, generator, operator or disposer of hazardous or toxic substances found or identified at the site, and the Owner shall undertake all such functions.

END OF SECTION

SECTION 01 12 16

SCOPE AND SEQUENCE OF WORK

PART 1 – GENERAL

1.01 WORK INCLUDED:

- A. The scope of work under this contract includes installation of structural steel framing, proposed 8 inch thick composite cast-in-place deck, .installation of FRP grating with support framing, crack repairs to existing concrete walls and slab, repairs of deteriorated existing concrete walls and slab, recaulking wall and slab joints, and cleaning of existing concrete slab of debris and vegetation at the existing primary clarifiers as shown on the plans and indicated in the contract documents.

1.02 RELATED WORK:

- A. SECTION 01 11 00 – CONTROL OF WORK AND MATERIALS

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL:

- A. The Contractor shall be responsible for scheduling its activities and the activities of any subcontractors and/or third party stakeholders involved, to meet the completion date, or milestones, established for the contract. Scheduling of the work shall be coordinated with the Owner and/or Engineer.
- B. The Construction Sequence Requirements shall be used by the Contractor to form a complete schedule for the project, which shall be coordinated with the Owner or Owner's designee. The Construction Sequencing Requirements listed below are not intended to be a comprehensive list of work required to be completed at the site. Contractor shall use best judgement and propose sequencing to minimize onsite construction time and maintain continuous operation the existing water treatment facility at the site. Prior to performing any work at the site, the Contractor shall submit a detailed plan to the Owner for review. The plan shall describe the proposed sequence, methods, and timing of the work.

3.02 CONSTRUCTION SEQUENCING REQUIREMENTS:

- A. The Contractor shall schedule all work so that the existing waste water treatment remains online during construction, until Substantial Completion and acceptance testing has been approved and completed by the Owner. Being online shall be defined

such that 100% of all facilities shall be fully operational and be available for use by the Owner.

- B. Sequencing of construction shall take into account the needs and schedule of the operation of the facilities such that they are not adversely affected by the work being performed by the Contractor. The Contractor shall make provisions for the Owner for continuous operation of the existing treatment plant such that Construction sequencing does not conflict with the normal operations of Owner.
- C. All existing processes must remain operational and able to perform their intended use at all times except where specifically allowed herein. Unless shutdown of a system is allowed, temporary systems shall be provided by the Contractor to ensure permit compliance and treatment process capability. Any temporary system must be approved by the Engineer, installed by Contractor, tested and operational prior to taking the existing system offline.
- D. The Contractor shall provide a written schedule of construction sequencing and shall obtain the Owner's approval of said schedule prior to the demolition or deactivation of any systems. The construction sequencing schedule shall include a written description of any proposed temporary measures that will be taken to maintain operations and shall be updated on a monthly basis, or whenever operations require a modification to the proposed sequencing. The Contractor shall provide the operations staff a daily update of proposed work so as to assure that it is coordinated in a manner that does not adversely affect the water treatment process.
- E. No treatment process, pumps, piping, valves, basins, or other equipment shall be taken offline in any manner, without written 72-hour notification to the Owner.
- F. The Contractor shall make every effort to coordinate connection to and use of the existing yard piping and distribution system to maintain operation of the treatment facility.

END OF SECTION

SECTION 01 14 00
SPECIAL PROVISIONS

PART 1 - GENERAL

Not used

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.01 WATER FOR CONSTRUCTION PURPOSES:

- A. In locations where water is in sufficient supply, the Contractor may be allowed to use water without charge for construction purposes. The express approval of the Owner shall be obtained before water is used. Waste of water by the Contractor shall be sufficient cause for withdrawing the privilege of unrestricted use.

3.02 PIPE LOCATION:

Pipe shall be located substantially as indicated on drawings. The Owner reserves the right, acting through the Engineer, to make such modifications as may be deemed desirable to avoid interference with existing structures or for other reasons.

3.03 DIMENSIONS OF EXISTING STRUCTURES:

Where the dimensions and locations of existing structures are of critical importance in the installation or connections of new work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment that is dependent on the correctness of such information.

3.04 OCCUPYING PRIVATE PROPERTY:

The Contractor shall not enter upon nor occupy with men, equipment or materials any property outside of the Owner's easements, except with the written consent of the property owner or property owner's agent.

3.05 EXISTING UTILITY LOCATIONS – CONTRACTOR'S RESPONSIBILITY:

- A. The location of existing underground services and utilities shown on the drawings is based on available records. It is not warranted that all existing utilities and services are

shown, or that shown locations are correct. The Contractor shall be responsible for having the utility companies locate their respective utilities on the ground prior to excavating.

- B. To satisfy the requirements of Connecticut law, the Contractor shall, at least 72 hours, exclusive of Saturdays, Sundays and holidays, prior to excavation in the proximity of telephone, gas, cable television and electric utilities, notify the utilities concerned by calling "CALL BEFORE YOU DIG" at telephone number: 1-800-922-4455.
- C. The Contractor shall coordinate all work involving utilities and shall satisfy itself as to the existing conditions of the areas in which it is to perform its work. It shall conduct and arrange its work so as not to impede or interfere with the work of other contractors working in the same or adjacent areas.

3.06 COORDINATION OF WORK:

The General Contractor shall be responsible for coordinating its own work as well as that of any subcontractors. He shall be responsible for notification of the Engineer when each phase of work is expected to begin and the approximate completion date.

3.07 MAINTENANCE OF TRENCH SURFACE:

After backfilling and compacting the trench, the Contractor shall be responsible for keeping the ground surface dry and passable at all times until the surface has been restored to original conditions.

3.08 DESIGN OF EQUIPMENT:

Attention is directed to the fact that the layout of certain equipment is based on that of one manufacturer. If other equipment is submitted for approval, the Contractor shall prepare and submit for approval at its expense, detailed structural, mechanical and electrical drawings, equipment lists, maintenance requirements, and any other data required by the Engineer, showing all necessary changes and embodying all special features of the equipment he proposes to furnish. Such changes, if approved, shall be made at the expense of the Contractor.

3.09 COMPLIANCE WITH PERMITS:

The Contractor shall perform all work in conformance with requirements of the Permits, which the contractor will procure through the Town of Simsbury.

3.10 CUTTING, FITTING AND PATCHING:

- A The Contractor shall do all cutting, fitting, or patching of its work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors, as shown upon or reasonably implied by the drawings and the specifications for the completed structure, including all existing work.

- B. The Contractor shall not endanger any work by cutting, digging, or otherwise and shall not cut or alter the work of any other Contractor, save with the consent of the Engineer.
- C. All holes or openings required to be made in new or existing work, particularly at pipe, conduit, or other penetrations not covered by escutcheons or plates shall be neatly patched. All such holes shall be made completely watertight as approved by the Engineer.
- D. Size and locations of holes required in steel, concrete, or other structural or finish materials for piping, wiring, ducts, etc., which have not been located and detailed on the drawings shall be approved by the Engineer prior to layout and cutting thereof. All holes shall be suitably reinforced as required by the Engineer.
- E. Workmanship and materials of patching and repair work shall match the adjacent similar work and shall conform to the applicable sections of the specification. Patches and joints with existing work shall provide, as applicable in each case, visual, structural, and waterproofing continuity.

3.11 CONTRACTOR'S REPRESENTATIVE:

The Contractor shall designate a representative who will be available to respond to emergency calls by the Owner at any time day and night and on weekends and holidays should such a situation arise.

3.14 HOURS OF CONSTRUCTION ACTIVITY:

- A. The Contractor shall conduct all construction activity between 7:00 a.m. and 4:00 p.m., Monday through Friday. No construction work shall be allowed on Saturdays, Sundays or Holidays without written authorization from the Owner.
- B. The Owner will provide personnel for assistance in locating and operating valves at no cost to the Contractor during the Owner's normal working hours.

END OF SECTION

SECTION 01 14 19.16

DUST CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION:

This section of the specification covers the control of dust via calcium chloride and water, complete.

PART 2 - PRODUCTS

2.01 CALCIUM CHLORIDE:

(Not Applicable)

2.02 WATER:

- A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

PART 3 - EXECUTION

3.01 APPLICATION:

- A. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.
- B. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

END OF SECTION

SECTION 01 33 23

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The Contractor shall provide the Engineer with submittals as required by the contract documents.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. As required by the General Conditions, Contractor shall submit a schedule of shop and working drawing submittals.
- B. The Contractor shall submit the shop and working drawing submittals either electronically or hard copy.

3.02 ELECTRONIC SUBMITTALS:

- A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer by email one electronic copy in Portable Document Format (PDF) of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- B. Each electronic copy of the shop or working drawing shall be accompanied by the Engineer's standard shop drawing transmittal form, included as Exhibit 1 of this section (use only for electronic submittals), on which is a list of the drawings, descriptions and numbers and the names of the Owner, Project, Contractor and building, equipment or structure.
- C. The Contractor shall receive a shop drawing memorandum with the Engineer's approval or comments via email.

3.03 SHOP AND WORKING DRAWINGS:

- A. Shop and working drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish of shop coat,

grease fittings, etc., depending on the subject of the drawings. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.

- B. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those, which are made by changing existing standard shop or working drawings. All drawings shall be clearly marked with the names of the Owner, Project, Contractor and building, equipment or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by the Engineer's (if applicable) standard shop drawing transmittal form on which is a list of the drawings, descriptions and numbers and the names mentioned above.
- C. Only drawings that have been prepared, checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Contract Documents in all respects. Shop drawings shall be reviewed and marked with the date, checker's name and indication of the Contractor's approval, and only then shall be submitted to the Engineer. Shop drawings unsatisfactory to the Contractor shall be returned directly to their source for correction, without submittal to the Engineer. Shop drawings submitted to the Engineer without the Contractor's approval stamp and signature will be rejected. Any deviation from the Contract Documents indicated on the shop drawings must be identified on the drawings and in a separate submittal to the Engineer, as required in this section of the specifications and General Conditions.
- D. The Contractor shall be responsible for the prompt submittal and resubmittal, as necessary, of all shop and working drawings so that there will be no delay in the work due to the absence of such drawings.
- E. The Engineer will review the shop and working drawings as to their general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections of comments made on the drawings during the review do not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner. The review of the shop drawings is general and shall not relieve the Contractor of the responsibility for details of design, dimensions, code compliance, etc., necessary for interfacing with other components, proper fitting and construction of the work required by the Contract and for achieving the specified performance. The Engineer will review submittals two times: once upon original submission and a second time if the Engineer requires a revision or corrections. The Contractor shall reimburse the Owner amounts charged to

- the Owner by the Engineer for performing any review of a submittal for the third time or greater.
- F. With few exceptions, shop drawings will be reviewed and returned to the Contractor within 30 days of submittal.
 - G. No material or equipment shall be purchased or fabricated especially for this Contract nor shall the Contractor proceed with any portion of the work, the design and details of which are dependent upon the design and details of equipment or other features for which review is required, until the required shop and working drawings have been submitted and reviewed by the Engineer as to their general conformance and compliance with the project and its Contract Documents. All materials and work involved in the construction shall then be as represented by said drawings.
 - H. Two copies of the shop and working drawings and/or catalog cuts will be returned to the Contractor. The Contractor shall furnish additional copies of such drawings or catalog cuts when he needs more than two copies or when so requested.

3.04 SAMPLES:

- A. Samples specified in individual Sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.
- B. The number of samples submitted shall be as specified. Submittal and processing of samples shall follow the procedures outlined for shop and working drawings unless the specifications call for a field submittal or mock-up.
- C. Acceptance of samples will be acknowledged via a copy of the transmittal noting status. When samples are not acceptable, prompt resubmittal will be required.

END OF SECTION

EXHIBIT 1 TO SECTION 01 33 23 SUBMITTALS

SHOP DRAWING TRANSMITTAL FORM

Shop Drawing Transmittal				Weston & Sampson SM			
Instruction for Preparing Transmittal No action will be taken on any item unless accompanied by this form. TRANSMITTAL NOS. to be consecutive (1, 2, 3, etc.). Each resubmittal of same item shall use same number with suffix letter (A, B, etc.). SPEC. SECT. NO: Only one spec. section no. to each transmittal. DESCRIPTION: Complete identification of document or group of documents. SOURCE: Originator of document(s) being submitted.				DRAWING NO: Identification of document(s). CONTRACT DRAWING REFERENCE: Contract drawing number(s) showing details of document(s). SPECIAL INSTRUCTIONS: Special cases and emergencies, changes in distribution and special handling requests, etc. should be entered here. SIGNATURE OF CONTRACTOR: Signature of individual who reviews and approves material prior to submittal to engineer.			
THIS SECTION TO BE COMPLETED BY CONTRACTOR							
TRANSM. NO.		SPEC. SECT. NO.		DATE		CONTRACTORS JOB NO.	
PROJECT NAME & CONTRACT NO.				LOCATION			
T O Weston & Sampson Engineers 712 Brook Street, Suite 103 Rocky Hill, CT 06067				F R O M			
						By W&S	
ITEM NO.	DESCRIPTION			SOURCE	DRAWING NO. CATALOG NO. BROCHURE, ETC	NO. OF COPIES	CONTRACT DRAWING REF.
1							
2							
3							
4							
THIS CERTIFIES THAT ALL ITEMS SUBMITTED HEREWITH HAVE BEEN CHECKED BY THE CONTRACTOR, ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, EXCEPT AS NOTED, AND ARE APPROVED BY THE CONTRACTOR FOR THIS PROJECT.					SIGNATURE & TITLE		
THIS SECTION TO BE COMPLETED BY WESTON & SAMPSON							
ACTION CODE: 1. NO EXCEPTIONS TAKEN 2. MAKE CORRECTIONS NOTED 3. AMEND AND RESUBMIT 4. REJECTED-SEE REMARKS 5. ACKNOWLEDGEMENT 6. SUBMITTAL NOT REQUIRED, RETURNED WITHOUT REVIEW					a. INSTALLATION SHALL PROCEED ONLY WHEN ACTION CODE IS 1 OR 2 b. ACTION CODED 3 SHALL BE RESUBMITTED WITHIN TIME LIMIT SET IN CONTRACT c. REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY OF COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS		
					Weston & Sampson		

SECTION 01 45 23

STRUCTURAL TESTS AND INSPECTIONS

PART 1 -GENERAL

1.01 WORK INCLUDED:

- A. Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Obtaining, coordinating, and providing notifications to the Owner and Engineer.
 - 2. Provide safe access to the work of this Contract to accommodate the indicated tests and inspections.
 - 3. Implementing corrective action and providing additional tests and/or inspections for work identified as non-conforming by the Independent Testing Agency.

1.02 GENERAL REQUIREMENTS:

- A. The Connecticut State Building Code, Latest Edition, requires the Structural Engineer of Record (SER) to provide a program of structural tests and inspections for this project.
- B. Attachment A, Program of Structural Tests and Inspections, shall not relieve the Contractor or its subcontractors of their responsibilities and obligations for quality control of the Work; their other obligations for supervising the Work; for any design work which is included in their scope of services; for full compliance with the requirements of the Contract Documents; the detection of, or failure to detect, deficiencies or defects, whether detected or undetected, in all parts of the Work, and to otherwise comply with all requirements of the Contract Documents.
- C. The Program of Structural Tests and Inspection does not apply to the Contractor's equipment, temporary structures used by the Contractor to construct the project, the Contractor's means, methods, procedures, and job site safety.

1.03 CONTRACTOR RESPONSIBILITIES:

- A. The Contractor shall provide free and safe access to the Work for the SER and all other individuals who are observing the Work or performing structural tests or inspections. The Contractor shall provide all ladders, scaffolding, staging, and up-to-date safety equipment, all in good and safe working order, and qualified personnel to handle and erect them, as may be required for safe access.

- B. The Contractor shall give reasonable notice to the Owner and the Engineer of when the various parts of the Work will be ready for testing and/or inspection. The Contractor shall notify the Owner and the Engineer a minimum of 48 hours before such tests and/or inspections are to take place.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

ATTACHMENT A

PROGRAM OF STRUCTURAL TESTS AND INSPECTIONS

The following is a summary of Work subject to Tests and Inspections under the Program.

1. Controlled Structural Fill
2. Cast-In-Place Concrete
3. Structural Steel

<u>Abbreviation</u>	<u>Agent</u>
SER	Structural Engineer of Record
ITA	Owner – Independent Testing Agency will be contracted by the Owner

Controlled Structural Fill

Item	Agent	Scope
1. Controlled Structural Fill QC Review	SER	Review Contractor's field quality control procedures
2. Fill Material	ITA	Test material for conformance to specifications or geotechnical report. Perform laboratory compaction tests in accordance with the specifications to determine optimum water content and maximum dry density.
3. Installation of controlled structural fill	ITA	Provide full-time inspection of the installation, in accordance with the specifications.
4. Density of Fill	ITA	Perform field density tests of the in-place fill in accordance with the specifications.

Cast-In-Place Concrete Construction

Item	Agent	Scope
1. Cast-In-Place Concrete Construction QC Review	SER	Review Contractor's field quality control procedures. Review frequency and scope of field testing and inspections.
2. Mix Design	SER	Review Mix Designs
3. Materials	SER	Review material certifications for conformance to Specifications
4. Batching Plant	ITA	Review Plant quality control procedures and batching and mixing methods
5. Reinforcement Installation	ITA	Inspect reinforcing for size, quantity, condition and placement
6. Anchor Rods	ITA	Inspect anchor rods prior to and during placement of concrete.
6. Formwork	ITA	Inspect form sizes for proper sizes of concrete members.
7. Concrete Placement and Sampling fresh Concrete	ITA	Observe concrete placement operations. Verify conformance to specifications including cold-weather and hot-weather placement procedures. Perform slump, density and air content tests at point of discharge.
8. Evaluation of Concrete	ITA	Test and evaluate in accordance with the specifications.
9. Curing and Protection	ITA	Observe procedures for conformance to the specifications.

Structural Steel

Item	Agent	Scope
1. Fabricator Certification/Quality Control Procedures	SER	Review Contractor's field quality control procedures. Review frequency and scope of field testing and inspections.
2. Fabricator Certification/Quality Control Procedures	SER	Review each Fabricator's quality control procedures.
3. Fabricator Inspection	SER	Inspect in-plant fabrication, or review Fabricator's approved Independent Inspection Agency's reports.
4. Materials	SER	Review materials certifications for conformance to the specifications.
5. Anchor Rods	SER	Review Contractor's as-built survey.
6. Anchor Rods	ITA	Verify that all anchor rods have been properly torqued and have adequate fit-up.
7. Bolting	ITA	Test and inspect bolted connections in accordance with specifications. Verify bolt size and grade.
8. Welding	ITA	Check welder qualifications. Visually inspect fillet welds and test full penetration field welds in accordance with specifications
9. Structural Framing, Details, and Assembly	ITA	Inspect for size, grade of steel, camber, installation and connection details. Check against Contract Documents and approved shop drawings.
10. Expansion and Adhesive Anchors	SER	Review installation procedures for both mechanical anchors and adhesive anchors. Verify that materials are suitable for job conditions.
11. Field Correction of Fabricated Items	ITA	Review documentation of approved repairs and verify completion of repairs.

END OF SECTION

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SECTION 01 52 13

TEMPORARY FACILITIES

PART 1 -GENERAL

1.01 SCOPE OF WORK:

- A. The Contractor shall provide all temporary facilities as described in this Section for the proper completion of the work, as required and as specified.

1.02 TEMPORARY TOILETS:

- A. The Contractor shall provide and pay all costs for toilet booths with chemical type toilets, as necessary for all persons engaged in the Work.

1.03 TEMPORARY ELECTRICITY:

- A. The Contractor shall at his own expense make all arrangements for and provide all temporary light and power for all Subcontractors and trades, except as otherwise specified herein. The temporary electrical service shall include, but not be limited to, all labor, materials, and equipment necessary to supply temporary power of adequate capacity for the Project operations and testing. Transformers and meters, when required by the power company will be furnished and installed by the appropriate power company, and the Contractor shall pay all costs therefor. The Contractor shall dismantle and completely remove from the Project all temporary wiring and other temporary electrical accessories only when the permanent electrical system has been installed and in operation, and then only with written approval of the Engineer.

1.04 TEMPORARY STRUCTURES:

- A. The Contractor shall provide, maintain, and remove such additional storage sheds, temporary buildings, or trailers as required for performance of the Work. Location of all such temporary structures shall be acceptable to the Owner. If the Contractor is required to relocate these Temporary Structures during the prosecution of the Work, the Contractor shall promptly do so at no increase in Contract Price or Contract Time.

1.05 HOISTING, SCAFFOLDING, STAGING, AND PLANKING:

- A. The Contractor shall provide, set up and maintain all derricks, hoisting machinery, scaffolding, staging, and planking, and do all hoisting required for the Work, or any part of the Work.

1.06 TEMPORARY STAIRS, RAMPS, AND CHUTES:

- A. The Contractor at its own expense shall furnish, install, and maintain all temporary ramps, stairs, ladders, and chutes as required by the Contractor, all Subcontractors and trades for the proper completion of the Work. The Contractor shall remove these and other like items when they are no longer required and permanent stairs are installed.

1.07 WEATHER PROTECTION:

- A. It is the intent of these Specifications to require the Contractor to provide temporary enclosures and heat to permit construction work to be carried on during November through March. These Specifications are not to be construed as requiring enclosures or heat for operations that are economically not feasible in the judgment, in writing, of the Contractor. Included in this category, but without limitation, are such items as site work, excavation, roofing, and similar operations.

PART 2 - PRODUCTS
NOT USED

PART 3 - EXECUTION
NOT USED

END OF SECTION

SECTION 01 74 13

CLEANING UP

PART 1 - GENERAL

1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of its work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon request by the Engineer provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the Engineer.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

3.01 DAILY CLEANUP:

- A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.
- B. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.
- C. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

3.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

- A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

- A. On or before completion of the work, the Contractor shall, unless otherwise specifically required or permitted in writing, tear down and remove all temporary buildings and structures it built; shall remove all temporary works, tools and machinery or other construction equipment it furnished; shall remove all rubbish from any grounds which it has occupied; shall remove silt fences and hay bales used for trapping sediment; and shall leave the roads and all parts of the property and adjacent property affected by its operations in a neat and satisfactory condition.

3.04 RESTORATION OF DAMAGED PROPERTY:

- A. The Contractor shall restore or replace, when and as required, any property damaged by its work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

3.05 FINAL CLEANUP:

- A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.
- B. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the building to a "like new" condition. This cleanup shall include removing all trash and debris from the premises; sweeping and mopping of all floors; washing of all walls, windows and doors; cleaning and polishing of all finish metal surfaces; cleaning of all equipment, utilizing proper solvents for removal of oil and grease; cleaning of dirt and debris out of all mechanical and electrical cabinets; and all other related work required to render the building suitable for use. Before acceptance, the Engineer shall approve the condition of the building.

END OF SECTION

SECTION 01 78 39

PROJECT AS-BUILT RECORD DRAWINGS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers the Contractors As-Built Record drawings for the project. The As-Built Record drawings for the project shall include, but are not limited to:

- A. The Contractors construction coordination drawings for the project disciplines shall be submitted to the Engineer prior to Construction of the said discipline. The Contractors construction coordination drawings for the project disciplines shall include but are not limited to the following:

- 1. Architectural
- 2. Civil
- 3. Structural

- B. Draft Record Documents Review

Upon completion of the project construction the Contractor shall submit a complete copy of Record Drawings to the Owner and the Engineer for review. The Owner and the Engineer shall jointly review the Record Drawings and provide comments to the Contractor. The Contractor shall modify the Record Drawings as necessary based on the comments provided by the Owner and the Engineer.

- C. Final Record Documents

Upon incorporation and acceptance of the Draft Record Drawings comments from the Owner and the Engineer, the Contractor shall submit the Final Record Drawings and documentation.

1.02 AS-BUILT DOCUMENTS:

- A. Contractor shall maintain on site, separate from the documents used for construction, one complete set of the documents listed below, and as construction progresses, shall legibly record on these documents all changes made during construction.

- 1. Contract Drawings.
- 2. Specifications.
- 3. Addenda.

4. Change Orders and other Modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Written interpretations and clarifications.
7. Field Orders.
8. Field test reports properly verified.

B. The completed set of documents shall include but are not limited to:

1. Significant deviations of any nature made during construction.

C. The completed set of as-built documents shall be submitted to the Engineer with the final Application for Payment.

PART 2 - MATERIALS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 03 01 30.62

REPAIR OF EXISTING CONCRETE STRUCTURES

PART 1 GENERAL

1.01 WORK INCLUDED:

Furnish all labor, materials, equipment and incidentals required to repair deteriorated areas of existing concrete structures including the sealing of existing joints as required by the Engineer in the field and as specified herein.

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING

- A. Prior to shipment, and in accordance with Section 01 33 23, the Contractor shall submit to the Engineer for review, the following: manufacturer's technical literature for epoxy bonding agent, adhesive anchor system, repair mortar, polyurethane chemical grout, and strip and seal system. The Contractor shall include manufacturer's installation and or application instructions in the submittal.
- B. A complete, easily readable functional description of the proposed product.
- C. Upon completion of installation, the results of the field and acceptance tests as specified under this section of the specification shall be submitted to the Engineer.
- D. Furnish written certification from the manufacturer's representative of the proper installation and use of each product.

1.03 REFERENCES:

- A. The following standards form a part of this specification and indicate the minimum standards required:

American Society for Testing and Materials (ASTM)

ASTM C881 -Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

ASTM C882 -Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 QUALITY ASSURANCE:

- A. Do not begin repair work until authorized by the Engineer to do so.
- B. When removing deteriorated concrete erect barriers or other protective devices to prevent damage to the structures beyond the limits of new work, protect personnel, control dust and prevent damage by falling or flying debris.
- C. Unless otherwise indicated or specified, saw cut the limits of all concrete repairs.
- D. Furnish a notarized certificate stating that the materials to be provided meet the requirements of this Section and have the manufacturer's current printed literature on the specified product.

1.05 MANUFACTURER'S QUALIFICATIONS:

- A. Consideration shall be given only to well-established and reliable manufacturers who are regularly engaged in such work and thoroughly experienced in the design and manufacture of said systems. The manufacturer shall certify a minimum of ten (10) years of experience in the manufacture and use of the products specified under this section as evidence of meeting the experience requirement.
- B. The system described herein and shown on the drawings establishes a standard of required type, function and quality to be met by any proposed substitute or "or-equal" systems. All "or-equal" systems shall meet the exact system configuration and operational function as shown on the drawings and specified herein. No "or-equal" system shall be considered by the Engineer unless written request for approval has been submitted for and approved by the Engineer in writing. The burden of proof of merit for the proposed "or-equal" systems is upon the Contractor and the proposed equipment manufacturer. The Engineer's decision of approval or disapproval of a proposed item shall be final. If the Engineer approves any "or-equal" item, the Contractor shall indemnify, hold harmless and defend both the Owner and the Engineer from any claims associated with the "or-equal" systems. Approval of "or-equal" systems does not relieve the Contractor of any requirements specified herein, called for by the Engineer or shown on the drawings.

1.06 DELIVERY, STORAGE AND HANDLING:

Deliver products in original, unopened containers clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions. Storage and condition of products shall be as recommended by the manufacturer.

1.07 WARRANTY:

- A. The manufacturer shall warranty, in writing, that the products supplied under this Section fully meet the criteria specified herein and shall further warranty that the products are free from all defects in materials and workmanship.
- B. The manufacturer's warranties from defects shall contain a provision that the manufacturer shall repair or replace any defects, to the satisfaction of and at no additional cost to the Owner, for a period of twelve (12) months from the date of Substantial Completion.

PART 2 – Products

2.01 PATCHING MATERIALS:

- A. Materials shall comply with this Section and any Federal, State or local VOC limitations.
- B. Epoxy Bonding Agent

Provide a two-component, solvent-free, asbestos free moisture insensitive epoxy resin material used to bond plastic concrete to hardened concrete where indicated on the Drawings or directed by the Engineer. The Epoxy bonding agent shall comply with the requirements of ASTM C881, Type 11, Grade 2. Epoxy bonding agent shall be Sikadur 32, Hi-Mod by Sika Corporation, Lyndhurst, NJ; Epoxy Adhesive CR631 by Sto Concrete Restoration Division, Amherst, MA; Euco 452MV by Euclid Chemical Co., Cleveland, OH, or equal.

- C. Repair Mortar

- 1. Repair mortar shall be a two-component, polymer-modified, cementitious, fast-setting, trowel grade, non-sag, structural repair mortar suitable for use on horizontal, vertical and overhead surfaces, on grade, above, and below grade on concrete and mortar.
- 2. Material
 - a. The polymer modified cementitious system shall consist of a factory pre-proportioned two-component system whose components conform to the following requirements:
- 3. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives. This acrylic copolymer shall have the following properties:
 - i. Minimum film forming temperature approximately 68 degrees F
 - ii. Tensile Strength approximately 990 to 1,420 psi
 - iii. Elongation at break 500 to 900 percent

iv. Particle Size Range Less than 0.1 micron

4. Component B shall be a blend of selected Portland cements, specially graded aggregates, organic accelerator and admixtures for controlling setting time, water reducers for workability and a corrosion inhibitor.
5. The component ratio A:B shall be 1:7.2 by weight for horizontal repairs and 1:5.2 by weight for vertical and overhead repairs. The system shall not contain chlorides, nitrates, added gypsum, added lime, or high alumina cements. The system shall be non-combustible, either before or after cure.

a. Typical Properties of Mixed Components

1. Application Time (Working Time) -15 minutes after combining components
2. Finishing Time – 20 to 60 minutes after combining components
3. Color – Concrete Gray

b. Typical Properties of Cured Material

1. Splitting Tensile Strength (ASTM C496) -750 psi minimum at 28 days
2. Bond Strength.(ASTM C882) -2,200 psi minimum at 28 days
3. Thermal Compatibility (ASTM C884) -passes test
4. Compressive Strength (ASTM C109) -1 day, 3,000 psi minimum 7 days, 5,500 psi minimum 28 days, 7,000 psi minimum
5. Flexural Strength (ASTM C293) -28 days, 2,000 psi minimum
6. This system shall not produce a vapor barrier.
7. This system shall be thoroughly compatible with concrete.
8. For horizontal repairs greater than 1-inch in thickness 3/8-inch coarse aggregate may be added. Do not use limestone aggregate.

c. Approved manufacturers include:

1. Repair mortar for horizontal surfaces shall be SikaTop 122 Plus by Sika Corporation, Lyndhurst, NJ or equal.
2. Repair mortar for vertical and overhead surfaces shall be SikaTop 123 Plus by Sika Corporation, Lyndhurst, NJ or equal.

2.02 BACKER RODS:

- A. Open Cell Backer Rod -Extruded, open cell polyurethane foam. Diameter shall be not less than 200 percent of the joint width dimension.

- B. Closed Cell Backer Rod -Extruded, nonstaining, resilient closed cell polyethylene foam, compatible with sealant. Diameter shall be not less than 25 percent greater than the joint width. Sealant shall not adhere to backer rod.

2.03 POLYURETHANE CHEMICAL GROUT:

A. General

- a. The grouting compound shall be a single component, expanding, moisture reactive polyurethane grout that is designed to seal cracks and open joints in concrete. The cured chemical grout shall form a compressed closed cell urethane foam that shall completely fill the crack or joint.
- b. An accelerator may be used if recommended by the approved polyurethane chemical grout manufacturer.
- c. Injection packers shall be required for application of polyurethane chemical grout in existing concrete.

B. Material

- a. Properties of cured material
 - 1. Tensile Strength (ASTM D 1623): 15.5 psi minimum at 1 day.
Elongation at Break – 25 percent.
 - 2. Shear Strength (ASTM C273): 11.70 psi minimum at 1 day.
 - 3. Shrinkage (ASTM D2126): 0 percent
 - 4. Water Absorption (ASTM D2842): 0.09 lb/square ft
 - 5. Density (ASTM D1 622): 1.64 lb/cubic ft

C. Approved manufacturers include:

Sika Corporation, Lyndhurst, NJ – SilcaFix HH-LV, or equal.

PART 3 – EXECUTION

3.01 GENERAL:

- A. Repair deteriorated areas of concrete and seal existing joints and cracks as required by the Engineer and as specified herein.
- B. All commercial products shall be stored, mixed and applied in strict compliance with the manufacturer's recommendations and as specified herein.
- C. Where concrete is repaired in the vicinity of an expansion joint or control joint, preserve the isolation between components on either side of the joint.

3.02 CONCRETE REMOVAL:

- A. When removing deteriorated concrete, saw cut the limits of removal. Remove concrete such that existing concrete and reinforcing to be left in place and existing equipment in place are not damaged.
- B. Remove fractured, loose, deteriorated and unsound concrete by bush hammering, chipping, high pressure water blast or other appropriate means. Remove all dirt, oil, grease and all other bond inhibiting materials from surface. Exposed reinforcing steel, reinforcing to be incorporated into repair mortar, and corroded reinforcing steel shall be treated as specified herein. Saturate existing concrete surfaces with water. Restore area to original limits or as shown using repair mortar. Comply with manufacturer's recommendations for concrete removal, surface preparation, mixing, application, finishing, and curing.
- C. Repair or replace concrete specified to be left in place, which is damaged during concrete modifications as required by the Engineer at no additional cost to the Owner.

3.03 CONNECTION SURFACE PREPARATION FOR NEW CONCRETE:

- A. Prepare connection surfaces as specified below for concrete areas requiring patching or repairs as indicated on the Drawings, specified herein, or as required by the Engineer.
- B. Remove all loose and deteriorated materials, dirt, oil, grease, and all other bond inhibiting materials from the surface by dry mechanical means such as sandblasting, chipping or wire brushing. Uniformly roughen the concrete surface to approximately 1/4-in. amplitude with pointed chipping tools. Thoroughly clean surface of loose or weakened material and dust by dry mechanical means such as sandblasting and air blasting. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly embedded into the parent concrete.
- C. If reinforcing steel is exposed, clean it by dry mechanical means to remove all loose material, contaminants and rust as approved by the Engineer. If half of the diameter of the reinforcing steel or more is exposed, chip out a minimum of 1-in of concrete behind the steel. Do not damage reinforcing to be incorporated in new concrete while removing existing concrete.
- D. Prepare concrete surfaces in accordance with the following as indicated, specified or as required by the Engineer.
 - a. Method A – After the existing concrete surface at connection has been roughened and cleaned, thoroughly saturate with water and maintain saturation for a period of at least 12 hours. Brush on a 1/16-in. layer of cement and water mixed to the consistency of a heavy paste. Immediately

after application of cement paste, place new concrete or grout mixture as indicated.

- b. Method B – After the existing concrete surface has been roughened and cleaned, apply epoxy-bonding agent at connection surface. The field preparation and application of the epoxy-bonding agent shall comply strictly with the manufacturer's recommendations. Place new concrete or grout mixture as indicated within time constraints recommended by the manufacturer to ensure bond.

3.04 POLYURETHANE CHEMICAL GROUT:

- A. Apply polyurethane chemical grout to leaking cracks, joints, and voids in existing concrete.
- B. Clean concrete surfaces as required by the manufacturer of the polyurethane chemical grout.
- C. The polyurethane chemical grout shall be installed through drilled-in injection ports installed as recommended by the polyurethane chemical grout manufacturer. Installation and curing of polyurethane chemical grout shall be in accordance with manufacturer's requirements.
- D. Remove all excess material from the interior face of walls, floors, etc. and the exterior face of walls to the satisfaction of the Engineer.
- E. Remove all injection ports and seal with grout. The repair area shall be flush with the surrounding concrete surface.
- F. At completion of repairs, the Contractor, Engineer, and installers of the materials used on the repairs shall inspect the work. Any leaky joints, cracks, or voids shall be repaired in accordance with the manufacturer's instructions at no additional cost to the Owner. At the completion of the repairs, the Contractor, Engineer, and installers of the materials shall again inspect the repaired problem areas.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 -GENERAL

1.1 GENERAL PROVISIONS:

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK:

- A. Work Included: This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following:
 - 1. Footings
 - 2. Foundation walls
 - 3. Knee walls
 - 4. Slab-on-grade
 - 5. Suspended slabs
 - 6. Interior equipment (housekeeping) pads
 - 7. Exterior slabs, including fuel island, and sidewalks
 - 8. Mud mats
 - 9. Concrete toppings
 - 10. Anchor Rods
 - 11. Grout

1.3 SUBMITTALS:

- A. Refer to Section 01 33 23, SUBMITTALS for submittal provisions and procedures.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, water-stops, joint systems, curing compounds, dry-shake finish materials, anchor rods, and others if requested by the Engineer or SER.
- C. Shop drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 “Manual of Standard Practice for Detailing Reinforced Concrete Structures”. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices

and laps, mechanical connections, tie spacing, hoop spacing and supports for concrete.

1. Shop drawings for building foundation reinforcing cannot reviewed and approved until pre-engineered anchor bolt drawings and reaction forces are submitted, reviewed, and approved.
- D. Submit shop drawings for all formwork for Architecturally Exposed Concrete (Concrete Exposed to View) showing cone tie patterns.
- E. Concrete mix design for each mix specified. Supporting test data shall be submitted if requested.
1. Submit alternate mix designs when the characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 2. Indicate the amounts of mixing water to be withheld for later addition at the Project site.
- F. Proposed method of curing and associated products.
- G. Proposed precautions for hot weather and cold weather concreting.
- H. Samples: For waterstops.
1. Submit samples of materials as requested by the Engineer or SER, including names, sources, and descriptions.
- I. Laboratory test reports for concrete materials and mix design test.
- J. Material test reports for the following, from a qualified testing agency, indicating compliance with specification requirements:
1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- K. Material certificates for each of the following, signed by the manufacturers:
1. Cementitious material.
 2. Admixtures
 3. Form materials and form-release agents.
 4. Steel reinforcement and accessories.
 5. Non-metallic shrinkage resistant grout.
 6. Waterstops.
 7. Anchor Rods.
 8. Curing compounds.
 9. Floor and slab treatments.

10. Bonding agents.
 11. Adhesives.
 12. Vapor retarders.
 13. Semi-rigid joint filler.
 14. Joint-filler strips.
 15. Repair materials.
- L. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- M. Qualification Data: For Installer and Manufacturer.
- N. Minutes of pre-installation conference.

1.4 QUALITY ASSURANCE:

- A. Installer Qualifications: A qualified installer who employs on the Project personnel qualified as ACI certified Flatwork Technician and Finisher and a supervisor who is an ACI certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mix concrete products that complies with ASTM C 94 requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency for Mix Design Qualifications: An independent agency, registered in the State of Connecticut as an approved testing agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician – Grade 1. The Testing Agency Laboratory supervisor shall be an ACI certified Concrete Laboratory Testing Technician – Grade II.
- D. Source Limitations: Obtain each type of class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- E. ACI Publications:

1. Comply with the following unless modified by requirements in the Contract Documents:
 - a. ACI 117, "Standard Specifications for Tolerances for Concrete Construction and Materials."
 - b. ACI 211.1, "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete."
 - c. ACI 214, "Evaluation of Strength Test Results of Concrete."
 - d. ACI 301, "Specification for Structural Concrete."
 - e. ACI 304, "Guide for Measuring, Mixing, Transporting and Placing Concrete."
 - f. ACI 305, "Hot Weather Concreting."
 - g. ACI 306, "Cold Weather Concreting."
 - h. ACI 308, "Guide to Curing Concrete."
 - i. ACI 309, "Guide for Consolidation of Concrete."
 - j. ACI 311.1, "ACI Manual of Concrete Inspection."
 - k. ACI 315, "Details and Detailing of Concrete Reinforcement."
 - l. ACI 318, "Building Code Requirements for Structural Concrete and Commentary."
 - m. ACI 347, "Guide for Formwork for Concrete."
 - n. ACI 350, "Code Requirements for Environmental Engineering Concrete Structures"
2. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

F. American Society for Testing and Materials (ASTM):

1. ASTM C309 "Liquid Membrane-Forming Compounds for Curing Concrete."
2. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete."
3. ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete."

G. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO M194 "Chemical Admixtures."

H. Pre-installation Conference: Conduct a conference at the Project site

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require

representatives of each entity directly concerned with cast-in-place concrete to attend including the following:

- a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Structural Engineer.
 - f. Independent testing agency responsible for field testing.
 - g. Owner's Authorized Representative.
 - h. Engineer.
2. Review inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint filler strips, semi-rigid joint fillers, forms and form removal limitations, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor slab and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS:

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other approved panel materials.
 2. Formwork for elements exposed to view, including, but not limited to knee walls, above grade piers, and exposed faces of retaining walls, shall conform to Surface Finish 3.0 per ACI 301.
- B. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units

with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, $\frac{3}{4}$ -inch by $\frac{3}{4}$ -inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

- 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral earth pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
- G. Furnish units that will leave no corrodible metal closer than 1-inch to the plane of exposed concrete surface.
- H. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT:

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
 - 1. Provide reinforcing bars conforming to ASTM A706, Grade 60, deformed, if welding is required.
- B. Plain Steel Wire: ASTM A 82, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 NON-METALLIC SHRINKAGE RESISTANT GROUT:

- A. Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time. The minimum ultimate compressive strength of the grout shall be 5000 psi at 7 days and 7500 psi at 28 days.

2.4 REINFORCEMENT ACCESSORIES:

- A. Joint Dowel Bars: ASTM A 615, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolster, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice", of greater of compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless steel bar supports.
 - 2. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Concrete bricks may be used to support reinforcing steel where application allows.

2.05 ANCHOR RODS

- A. Anchor Rods: ASTM F 1554, Grade 55 (Weldable), Hot Dipped Galvanized per ASTM A 153. Headed type unless otherwise noted. Provide suitable nuts in accordance with ASTM F1554 and ASTM A563 and washers in accordance with ASTM F436. Nuts and washers shall be hot-dipped galvanized.
- B. Anchor rod required diameters are as specified by the Prefabricated Engineered Building Manufacturer and approved by the Engineer. Embedment depths are as specified by the Engineer.

2.6 CONCRETE MATERIALS:

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout the Project:
 - 1. Portland Cement: ASTM C 150, Type I/II. Supplement with the following:
- B. Fly Ash: ASTM C 618, Class C or F.
- C. Ground Granulated Blast Furnace Slag: ASTM C 989, Grade 100 or 120.
- D. Cementitious Materials: Percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
 - 1. Fly Ash or Ground Granulated Blast Furnace Slag: 25 percent, minimum.
 - 2. Combined Fly Ash and Pozzolan: 35 percent, maximum.
 - 3. Ground Granulated Blast Furnace Slag: 50 percent, maximum.

4. Combined Fly Ash or Pozzolan and Ground Granulated Blast Furnace Slag: 50 percent Portland cement minimum, with fly ash or pozzolan not exceeding 35 percent.
- E. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
1. Maximum Coarse Aggregate Size: $\frac{3}{4}$ -inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- F. Water: ASTM C 94 and potable.

2.7 ADMIXTURES:

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494, Type A.
 2. Retarding Admixture: ASTM C 494, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.
- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494, Type C.
1. Products:
 2. Euclid Chemical Company; Eucon CIA.
 3. Grace Construction Products, W.R. Grace & Co.; DCI.
 4. BASF Admixtures, Inc.; Rheocrete CNI.
 5. Sika Corporation; Sika CNI.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor;

capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

1. Products:

- a. Grace Construction Products, W.R. Grace & Co.; DCI-S.
- b. Sika Corporation: Sika FerroGard 903
- c. Euclid Chemical: Eucon BCN

E. Concrete Moisture Vapor Reduction Admixture: Refer to Specification Section 03 05 10.

F. Integral Crystalline Waterproofing Admixture Incorporate into concrete mix design per the manufacturer's recommendations.

1. Products:

- a. Penetron Admix, Penetron International Ltd.
- b. Xypex Admix C-500, Xypex
- c. Aquafin-IC Admix, Aquafin Inc.

2.8 WATERSTOPS:

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, $\frac{3}{4}$ -inch by 1-inch.

- 1. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
- 2. Concrete Sealants, Inc.; Conseal CS-231.
- 3. Sika; Swellstop.
- 4. Henry Company, Sealants Division; Hydro-Flex.
- 5. Carlisle; Mirastop.

B. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, $\frac{3}{8}$ -inch by $\frac{3}{4}$ -inch.

- 1. Sika; Hydrotite.
- 2. Or approved equal.

C. Strip applied non-swelling mastic waterstop.

- 1. Sika Greenstreak; Lockstop
- 2. Or approved equal.

- D. Waterstops: Provide ribbed, dumbbell type or center bulb type waterstops at construction joints and other joints as indicated.

1. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.

2.9 FLOOR AND SLAB TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.

1. Products:

- a. Dayton Superior Corporation; Day-Chem Sure Hard.
- b. Euclid Chemical Company; Euco Diamond Hard.
- c. L&M Construction Chemicals, Inc.; Seal Hard.
- d. Meadows, W.R., Inc.; Liqui-Hard.
- e. Or approved equal.

- B. Exterior slab treatment: Clear solvent free silane treatment that is UV stable and vapor permeable to reduce water and chloride ion intrusion.

1. Products:

- a. Sikagard 740 W by Sika Corporation
- b. MasterProtect H 1000 (formerly Hydrozo 100) by BASF
- c. Intraguard by W.R. Meadows
- d. Or approved equal

2.10 CURING MATERIALS:

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz. /sq. yd. when dry.

- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- C. Water: Potable.

- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, non-dissipating, certified by curing compound manufacturer to not interfere with bonding of floor coverings.

1. Products:

- a. Dayton Superior Corporation; Safe Cure and Seal (J-19).
- b. Euclid Chemical Company; Diamond Clear VOX.

- c. Lambert Corporation; Glazecote Sealer-20.
 - d. L&M Construction Chemicals, Inc.; Dress & Seal WB.
 - e. Meadows, W.R., Inc.; Vocomp-20.
 - f. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 200E.
 - g. Sonneborn, Div. Of ChemRex; Kure-N-Seal.
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- 1. Products:
 - a. Euclid Chemical Company; Super Diamond Clear VOX.
 - b. Lambert Corporation; UV Safe Seal.
 - c. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
 - d. Meadows, W.R., Inc.; Vocomp-30.

2.11 RELATED MATERIALS:

- A. Expansion and Isolation Joint Filler Strips: ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.0217-inch thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336-inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.12 REPAIR MATERIALS:

- A. Repair Underlayment: Cement based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by the underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C 109.
- B. Repair Overlayment: Cement based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by the topping manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C 109.

2.13 CONCRETE MIXTURES, GENERAL:

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
 - 1. Fly Ash: 25 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
 - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent.

- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing, high-range water reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water cementitious materials ratio below 0.50 or as specified.
 - 4. Use retarding admixture in combination with set accelerating Corrosion Inhibitor. Retarder is not required for non-set accelerating corrosion inhibitor.
 - 5. Use corrosion inhibiting admixture in concrete mixtures where indicated.
 - 6. Use moisture vapor reduction admixture on all slabs to receive floor finishes. Refer to Specification Section 03 05 10.
 - 7. Use integral crystalline waterproofing admixture in concrete mixtures where indicated.

2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS:

- A. Footings and Foundation Walls and Piers: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45
 - 3. Slump Limit: 4-inches, plus or minus 1-inch, prior to adding high-range water-reducing admixture or plasticizing admixture, maximum slump with admixture is 6 inches
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
 - 5. Corrosion Inhibiting Admixture: Apply to walls and piers at a rate of 2 gallons per cubic yard of concrete.
- B. Interior Slabs-on-Grade and Equipment Pads: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 4-inches, plus or minus 1-inch, prior to adding high-range water-reducing admixture or plasticizing admixture, maximum slump with admixture is 6 inches
4. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
5. Corrosion Inhibiting Admixture: Apply to slabs exposed to vehicles traffic/parking or exposed to chemicals at a rate of 2 gallons per cubic yard of concrete.
6. Provide moisture vapor reduction admixture on all slabs to receive floor finishes. Refer to Specification Section 03 05 10.

C. Exterior Slabs, Sidewalks, Flagpole Foundations: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 5000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.40.
3. Slump Limit: 4-inches, plus or minus 1-inch, prior to adding high-range water-reducing admixture or plasticizing admixture, maximum slump with admixture is 6 inches
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size
5. Corrosion Inhibiting Admixture: Apply at a rate of 2 gallons per cubic yard of concrete.

D. Suspended Slabs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50
3. Slump Limit: 4-inches, plus or minus 1-inch, prior to adding high-range water-reducing admixture or plasticizing admixture, maximum slump with admixture is 6 inches
4. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
5. Provide moisture vapor reduction admixture on all slabs to receive floor finishes. Refer to Specification Section 03 05 10.

E. Concrete Toppings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45
3. Slump Limit: 4 inches, plus or minus 1 inch.

4. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
5. Provide moisture vapor reduction admixture on all slabs to receive floor finishes. Refer to Specification Section 03 05 10.

2.15 FABRICATING REINFORCEMENT:

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice".

2.16 CONCRETE MIXING:

- A. Ready-Mix Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information.
- B. When air temperature is between 85- and 90-degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing.

3.2 FORMWORK:

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117. For elements exposed to view, conform to Surface Tolerance A.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 1. Class A, 1/8-inch for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspections ports where interior area formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.3 EMBEDDED ITEMS:

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges".
 - a. Anchor rods shall be installed as specified by the Prefabricated Engineered Building Manufacturer and as approved by the Engineer.
 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

3.4 REMOVING AND REUSING FORMS:

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form removal operations and curing and protection operations are maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Engineer.

3.5 STEEL REINFORCEMENT:

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire ties.

3.6 JOINTS:

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or approved by the Engineer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2-inches into concrete.
 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 4. Locate horizontal joints in walls and columns at the underside of floors, slabs, beams, and girders and at the top of footings and floor slabs.
 5. Space vertical joints in walls at 60-feet on center maximum. Locate joints besides piers integral with walls, near corners, and in concealed locations where possible.
 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge joint to a radius of 1/8-inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Terminate full-width joint filler strips not less than 1/2-inch or more than 1-inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants", are indicated.

2. Install joint filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT:

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 and maintaining specified water-cement ratios.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
 2. The concrete supplier shall have procedures in place to verify quantity of water added. Quantity shall be noted on delivery ticket.
 3. The independent testing agency shall perform tests after water is added
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6-inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in continuous operation, within limits of construction joints, until placement of panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 degrees F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, providing water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing of concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES:

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to view.
- B. Smooth-Formed Finish: Provide Surface Finish 3.0 per ACI 301 and Surface Tolerance Class A per ACI 117. As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with minimum number of

seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to view including but not limited to knee walls, above grade piers, and exposed faces of retaining walls.
 2. Mock-up of concrete surface appearance is not required.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth finish with texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS:

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straightening until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155 for a randomly trafficked floor surface:
 3. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
- D. Broom Finish: Apply a broom finish to exterior platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

3.10 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.11 CONCRETE PROTECTING AND CURING:

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Curing all slabs in the project with moisture curing. Keep surfaces continually moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in the widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape

or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subject to heavy rainfall within three hours after initial applications. Maintain continuity of coating and repair damage during curing period.
 - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subject to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply second coat. Maintain continuity of coating and repair damage during curing period.
- D. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

3.12 LIQUID FLOOR TREATMENTS:

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment to concrete floors exposed to view according to manufacturer's written instructions.
 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Comply with Manufacturer's written instructions for application.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.13 JOINT FILLING:

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.14 CONCRETE SURFACE REPAIRS:

- A. Defective Concrete: repair and patch defective areas when approved by the Engineer. Remove and replace concrete that cannot be repaired and patched to the Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than ½-inch in any dimension in solid concrete, but not less than 1-inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush coat holes and voids with bonding agent. Fill and compact patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 1. Repair finished surfaces containing defects. Surface defects include spalls, pop outs, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14-days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Repair defective areas, except random cracks and single holes 1-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least $\frac{3}{4}$ -inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 6. Repair random cracks and single holes 1-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72-hours.
- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to the Engineer's approval.

3.15 FIELD QUALITY CONTROL:

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.

- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample of each day's placement of each concrete mixture exceeding 5 cubic yards, but less than 25 cubic yards, plus one set for each additional 50 cubic yards or fraction thereof.
 2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's placement of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's placement of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test for each composite sample.
 5. Density of Freshly Mixed Concrete: ASTM C 138; for calculating unit weight. Perform test when placing lightweight concrete mixes.
 6. Compression Test Specimens: ASTM C 31.
 7. Cast and laboratory cure five (minimum) standard cylinder specimens for each composite sample.
 8. Compressive Strength Tests: ASTM C 39; test one set of two-laboratory-cured specimens at 7 days and one set of two specimens at 28 days. Test remaining specimen at 28 days if previous results are satisfactory or retain this specimen for 56 day testing if results are not satisfactory.
 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive strength tests equals or exceeds specified compressive strength and no compressive strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to the Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7 and 28 day tests.
1. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as the sole basis for approval or rejection of concrete.

2. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as required by the Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as required by the Engineer.
 3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 4. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 24 hours of finishing.

3.16 GROUTING:

- A. Mix grout in accordance with the approved manufacturer's instructions to a consistency which will permit placement. Place grout so as to ensure complete bearing and elimination of air pockets.

3.17 TEST FOR WATERTIGHTNESS:

- A. All concrete shall be watertight against leakage or groundwater infiltration. Special care shall be taken in the construction joints and any noticeable leakage or seepage causing wet spots on the concrete walls or slabs shall be repaired by and at the expense of the Contractor and by methods approved by the Engineer. See Section 03150, WATERSTOPS.
- B. All liquid holding concrete structures shall be tested for leakage before backfilling and after the concrete has attained the specified minimum 28-day design strength, as indicated by test cylinders.
- C. The structure shall be filled with water to the overflow level, allowed to stand for at least 24-hours, and refilled to overflow to begin the test. After 72 hours, the liquid loss per 24 hour period shall be determined, either by measuring the amount required to refill the tank to overflow, by measuring the drop in water level, or by an equivalent procedure approved by the Engineer. Evaporative losses shall be calculated and deducted from the measured loss to determine net liquid loss (leakage). If the leakage per 24-hour period exceeds the allowable, the structure shall be repaired and retested until the leakage falls within the allowable limit.

- D. For structures designed to hold water, one twentieth of one percent leakage will be allowed during a 24-hour period. No leakage (zero leakage) will be permitted for structures designed to hold liquid chemicals or fuels.
- E. The Contractor shall pay all costs (including water) incurred in the testing for watertightness.
- F. The Engineer shall be given a minimum notice of 48 hours prior to commencement of the leakage test.

END OF SECTION

SECTION 05 12 33
STRUCTURAL STEEL

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The work of this Section consists of providing all labor, materials, and equipment required to furnish, fabricate, and erect the work of this Section including but not limited to:
 - 1. Providing leveling plates, bearing plates, anchor bolts, beams, baseplates, bracing and connections, angles, channels, stiffeners, separator plates, clips, supports for steel deck at columns, openings, connections, welding filler material and electrodes, connection bolts, erection bolts, and any other structural steel called for on the Drawings.
 - 2. Items of structural steel required to be built into concrete or masonry, as indicated or specified, shall be furnished to the respective trades at the proper time with complete instructions and template to facilitate inspection.
 - 3. Design of bolted/welded connections.
 - 4. Furnishing and installation of non-shrink grout under leveling and base plates.
 - 5. Unless specifically excluded, providing all other items for structural steel work indicated on the Drawings, specified, or obviously needed to make the work of this Section complete.
 - 6. All steel items shown or indicated on the Structural Drawings.
 - 7. Furnishing any temporary bracing necessary for support and alignment of the work, and shop painting as herein specified.
 - 8. Structural steel shall consist of all material as defined in Section 2, "Definition of Structural Steel," of the AISC Code, and accessory material called for, or reasonably implied by the drawings.

1.02 RELATED WORK:

- A. Section 01 45 23 – STRUCTURAL TESTS AND INSPECTIONS
- B. Section 03 30 00 - CAST-IN-PLACE CONCRETE

1.03 REFERENCES:

- A. The following standards from a part of these specifications as referenced:
 - 1. American Institute of Steel Construction (AISC)
 - a. Code of Standard Practice for Steel Buildings and Bridges
 - b. Specification for Structural Steel for Buildings
 - c. Manual of Steel Construction
 - d. Specification for Structural Joints Using ASTM A325 or A490 Bolts

2. American Society for Testing and Materials (ASTM)
 - a. ASTM A36 Structural Steel
 - b. ASTM A307 Carbon Steel Externally and Internally Threaded Standard Fasteners
 - c. ASTM A325 High Strength Bolts for Structural Steel Joints
 - d. ASTM A490 Heat-treated Steel Structural Bolts, 150 ksi Min. Tensile Strength
 - e. ASTM A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing
 - f. ASTM A563 Carbon and Alloy Steel Nuts
 - g. ASTM F436 Hardened Steel Washers
 - h. ASTM A992 Standard Specifications for Structural Steel Shapes
3. American Welding Society (AWS)
 - a. AWS D1.1 Structural Welding Code Steel
4. Steel Structures Painting Council (SSPC)
 - a. SSPC-SP 6 Commercial Blast Cleaning
 - b. SSPC-PA 2, Shop, Field and Maintenance Painting
5. Connecticut State Building Code, Latest Edition.

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Product Data: Provide manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
 2. High-strength bolts (each type), including certified copies of mill reports for nuts and washers; include direct tension indicators if used.
 3. Structural steel primer paint.
 4. Touch-up paint for galvanized steel.
 5. Grout.
 6. Headed Stud Anchors.
 7. Adhesive/Expansion Anchors
- B. As-built Survey: Submit to the Engineer an as-built survey showing the locations of the anchor bolts prior to installation of leveling and bearing plates. This submittal is for information and file record.
- C. Standard Shop Details and Connection Design Calculations: Submit to the Engineer prior to submitting detailed shop drawings, design calculations and details for connections not shown on the Drawings. Calculations shall be prepared, signed, and sealed by a registered professional engineer. Calculations and drawings are

subject to review by the Engineer. The Engineer reserves the right to require revisions to this work at no additional cost to the Owner.

- D. Checked shop drawings shall be submitted to the Engineer for review and approval. Fabrication shall not begin until the Engineer has approved the shop drawings.
- E. Shop drawings shall include detail drawings, erection drawings, certifications, schedules, and all other information necessary for the fabrication and erection of component parts of the structure. The shop drawings shall be checked and properly coordinated with other parts of the construction. The following shall be included in the shop drawings:
 - 1. Type of steel for each member, location and identification mark of each member, dimensions, size and weight of members, location and size of cuts, copes, slots, holes and openings required by other trades, type and location of shop and field connections, type, size, and extent of all welds, joint welding procedures, welding sequence, and painting requirements.
 - 2. All requirements such as temporary members required for erection, including connections.
 - 3. Use standard welding symbols of the American Welding Society.
- F. Except as otherwise noted, the approval of shop drawings will be for size and arrangement of primary and secondary components and strength of connections. Any error in dimensions shown on the shop drawings shall be the responsibility of the Contractor.
- G. Submit manufacturer's certification of bolts, nuts, and filler metal for welding.

1.05 QUALITY ASSURANCE:

- A. Testing and Inspection
 - 1. Refer to Section 01 45 23 for Structural Testing and Inspections. Comply with the additional requirements specified in Section 01 45 23, Structural Tests and Inspections.
 - 2. The inspection and testing services provided by the Independent Testing Agency do not relieve the Contractor, the steel fabricator and erector from the responsibility to provide supervision, testing, inspection, and quality control in order to assure conformance with these specifications.
- B. The Contractor must utilize the services of a Professional Structural Engineer licensed in the State of **Connecticut** to design, sign, and seal calculations and drawings for the following:
 - 1. Connection designs indicated on the Drawings to be designed by the Contractor.
 - 2. Weld repairs.
 - 3. Welded and bolted connection repairs.

- 4. Revisions required because of erection misalignment, fabrication defects, damage from construction activities.
 - C. The Contractor is responsible for fit up and installation of all steel work and shall field verify all dimensions and conditions.
 - D. The fabricator shall possess a valid certificate, category I Conventional Steel Building Structures as issued through the AISC Quality Certification Program, or shall have a detailed Quality Control Plan subject to audit as indicated in Section 01450.
 - E. Welder, Tacker and Welding Operator Qualifications: Use welders, tackers and welding operators who are currently qualified by tests as prescribed in the Structural Welding Code, AWS D1.1 of the American Welding Society to perform type of work required. Headed stud welding operators shall also be qualified in accordance with AWS D1.1.
 - F. Welded connections shall be designed and detailed utilizing AWS prequalified joints.
- 1.06 DELIVERY, STORAGE, AND HANDLING:
- A. Store steel on platforms, skids, blocking or other supports to prevent dirt and debris contact. Protect from exposure to conditions that produce rust.
 - B. Handle steel so no parts are bent, broken or otherwise damaged and avoid damage to other material and work. Store beams with webs vertical. Exercise care to avoid scraping and overstressing the steelwork.
 - C. Ship small parts, such as bolts, nuts, washers, pins, fillers, and small connecting plates and anchors, in boxes, crates, or barrels. Pack separately each length and diameter of bolt and each size of nut and washer. Plainly mark an itemized list and description of the contents on the outside of each container.

PART 2 - PRODUCTS

2.01 STRUCTURAL STEEL MATERIALS:

- A. Rolled steel wide-flange shapes: ASTM A992.
- B. Steel channels, angles, plates and bars: ASTM A36.
- C. Structural Steel Tubing: ASTM A500 Grade B.

2.02 BOLTS, CONNECTORS, AND ANCHORS:

- A. High-Strength Structural Steel Bolts, Nuts and Washers:
 - 1. Bolts: ASTM A325.
 - 2. Nuts: ASTM A563.
 - 3. Washers: ASTM F436.

4. Where steel is indicated on the Drawings to be galvanized, bolts, nuts and washers shall be hot dip galvanized in accordance with ASTM A153.
 5. Refer to the Drawings for bolt head style requirements.
- B. Anchor Bolts: ASTM F1554. Grade 36, unless noted otherwise. Headed type unless otherwise noted. Provide suitable nuts in accordance with ASTM F1554 and ASTM A563 and washers in accordance with ASTM F436.
- C. Beveled Washers: Square, smooth and sloped to make contact surface of bolt head and nut parallel.
- D. Headed Stud Anchors: Embedment anchors shall be headed anchors with fluxed ends or approved equal. Stud size as indicated on the Drawings. Studs shall be automatically end welded with suitable equipment in the shop or field on spacing's indicated on the Drawings. All welds shall be made in accordance with the stud manufacturer's requirements. Field installed anchors shall be classified as Structural Steel.
1. Mechanical Properties of Headed Anchors. Low Carbon Steel complying with ASTM A108 Physical Properties:
 - a. Tensile (Minimum) 60,000 PSI (60KSI)
 - b. Yield (Minimum) 50,000 PSI (50KSI) (0.2% Offset)
 - c. Elongation (Minimum) 20% in 2-inches.
- E. Adhesive Anchor Bolt Anchoring Systems: Composed of an anchor rod, nut, washer and an anchor rod adhesive cartridge.
1. Anchor Rod Assembly: Chamfered end, all thread steel anchor rod with nut and washer. Size and load capacity as indicated on the Drawings.
 2. Adhesive Cartridge: Sealed capsule containing premeasured amounts of (resin, quartz sand aggregate, and a hardener contained in a separate vial within the capsule. Capsule ingredients activated by the insertion procedure of the anchor rod assembly.
 3. Acceptable Manufacturers:
 - a. Hilti Fastening Systems; HVA Adhesive System.
 - b. Powers Fastening, Inc.; Rawl Fastening Systems.
 - c. Or Approved Equal.
- F. Welding Electrodes: E70XX in accordance with AWS D1.1. Refer to the Drawings for special requirements at moment connections.

2.03 GROUT:

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.04 SHOP PRIMER PAINT:

- A. Products to be used shall meet the regulations of jurisdiction for Volatile Organic Compounds (VOC) emissions.
- B. Exterior Exposed Steel, Not Galvanized: Zinc-rich epoxy primer followed by an intermediate coat of epoxy paint.
- C. Other Steel, Not Galvanized: Zinc-rich epoxy primer.
- D. Shop primer paint shall be compatible with the specified finish paint system. Finish paints shall be in accordance with Section 09 90 00.

2.05 HOT-DIPPED GALVANIZING:

- A. Hot-dip galvanized steel fabrications so designated herein and on the drawings and after fabrication in compliance with ASTM A 123.
- B. Hot-dip galvanized iron and steel hardware shall be in accordance with ASTM A 153.

PART 3 - EXECUTION

3.01 FABRICATION:

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in the shop to the greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.
 - 1. Provide camber in structural members where indicated.
 - 2. Do not splice steel members unless given written approval by the Engineer.
 - 3. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
 - 4. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
- B. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on the final shop drawings.
- C. Cut, drill, and punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- D. Welding:
 - 1. Provide quality control and qualification of welders and welding procedures and operations as specified under "Testing and Inspection" in this Section.
 - 2. Shop Welded Process: Use shielded metal-arc, submerged arc, gas metal-arc, and flux cored-arc, or other process as approved by the Engineer.

3. Groove Welds: Provide complete penetration unless otherwise noted on the Drawings.
4. Fillet Welds: Where weld symbol is not shown or welds are not dimensioned, provide continuous fillet welds all around and on both sides as appropriate. Minimum dimension shall be as indicated in AISC Specification.
5. Base metal shall be checked by Contractor to insure absence of laminations or other defects. Welds shall be sound throughout and have no cracks.
6. Where structural joints are required to be welded, details of joints, technique of welding employed, appearance and quality of welds made, and methods used in correcting defective work shall conform to applicable requirements noted under References in this Section.
7. Prepare joint welding procedures and program of welding sequence (for each component and for welding jointing components to each other) and submit to Engineer for approval before any welding is done. After approval, welding procedures and sequences shall be followed without deviation unless specific approval for change is obtained from the Engineer. Engineer may require requalification's of these welding procedures by tests prescribed in AWS "Standard Qualification Procedures".
8. Each welder working on the project shall be assigned an identification symbol or mark. Each welder shall mark or stamp their identification symbol to each weldment completed, whether in shop or field.
9. Corrective Work: Structural steel elements having fabrication errors and/or which do not satisfy tolerance limits shall not be incorporated in finished work. Such elements may be corrected if permitted by the Engineer and/or Testing Agency. Submit to the Engineer drawings showing details of proposed corrective work. These drawings shall be approved by the Engineer prior to performing corrective work. Corrective work shall be performed in accordance with requirements of Contract Documents. Corrective work and any retesting which may be required shall be at the Contractor's expense.
10. Members scheduled to be fireproofed shall have surfaces prepared as required by the fireproofing material manufacturer.

3.02 SHOP PRIMER PAINTING:

A. General: Shop paint all structural steel, except as noted below:

1. Do not paint members which are to be galvanized.
2. Do not paint surfaces within two inches of any field weld (including shear connectors) or high strength bolted friction type connection.
3. Do not paint surfaces to be high-strength bolted with slip-critical connections, unless the paint is specifically compatible with slip-critical connections.
4. When members are to be partly embedded in concrete or mortar in the finished work, paint only the exposed portions and initial 2-inches of embedded areas. Do not paint members which will be entirely embedded in concrete or mortar in the finished work.

5. Do not paint surfaces to receive metal deck and/or shear connectors fastened by welding.
 6. Do not paint surfaces to receive sprayed-on fireproofing.
- B. Surface Preparation: At a minimum, clean steel in accordance with Steel Structures Painting Council (SSPC) as follows; except clean to more stringent surface preparation standard if required by primer manufacturer:
1. Steel to be primed with zinc-rich primer: Commercial Blast Clean (SSPC-SP6).
 2. Comply with AISC requirements for slip-critical connections.
- C. Painting
1. Immediately after surface preparation apply shop primer paint in accordance with manufacturer's recommendations.
 2. Apply shop paint in accordance with SSPC-PA-2.
 3. Minimum dry film thickness of shop paint shall be 4.0 mils.
 4. Comply with AISC requirements for slip-critical connections.
 5. Complete shop painting operations on completed shop welded connections after the connections have passed the specified structural tests and inspections.
 6. Apply two coats of paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

3.03 GALVANIZING:

- A. General: Hot-dip galvanize all steel exposed to weather or corrosive environments and as indicated on the drawings.
- B. Hot-dip galvanized steel shall be inspected for compliance with ASTM A 123 and shall be marked with a stamp that indicates the name of the galvanizer, the ASTM number, and the ounces of zinc per square foot of surface. A notarized Certificate of Compliance with all of the above shall be required from the galvanizer.
- C. Hot-dip galvanized hardware shall comply with ASTM A 153.
- D. Provide thickness of galvanizing specified in referenced standards.
- E. Fill vent holes and grind smooth after galvanizing.
- F. All hot-dip galvanized steel shall be safeguarded against embrittlement in conformance with ASTM A-143.
- G. Finish color, if required, will be specified by the Engineer.

3.04 ERECTION:

- A. Erect structural steel in accordance with the Drawings, the approved submittal documents, pertinent regulations, the referenced AISC standards and these Specifications.

1. Allow concrete foundations to reach a minimum of 14-day curing time before torquing of anchor bolts.
 2. Prior to installation of metal decking, clean the unpainted top flanges of structural steel members to be free of heavy rust, mill scale, dirt or such other substances detrimental to welding.
 3. Comply with 29 CFR Part 1926 - Safety Standards for Steel Erection.
- B. Surveys: Employ a licensed Land Surveyor or licensed engineer for accurate erection of structural steel. Check elevations on concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Engineer. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steel work have been agreed upon with Engineer.
- C. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.
- D. Setting base and bearing plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surfaces of leveling and bearing plates.
1. Set loose and attached leveling plates and bearing plates for structural members on steel wedges, shims, leveling devices, or as shown on the Drawings.
 2. Grout under the plates after they have been positioned, plumbed and leveled. Do not remove wedges or shims but, if protruding, cut off flush with top or edges of base plates, or both prior to packing with grout.
 3. Pack grout solidly between bearing surfaces and bases or plates to ensure no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 4. For proprietary grout materials, comply with manufacturer's instructions.
- E. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of the complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure within specified AISC tolerances.
 2. Establish required leveling and plumbing references with respect to expected mean service operating temperature inside the building. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

- F. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges".
- G. Splice members only where indicated and accepted on shop drawings.
- H. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

3.05 FIELD CONNECTIONS:

- A. General: Beams shall have framed connections using $\frac{3}{4}$ -inch diameter, minimum, high strength bolts in accordance with the requirements of AISC "Manual of Steel Construction" and Contract Drawings.
- B. High-Strength Bolts: Install high-strength steel-bolts in accordance with RCSC's "Specifications for Structural Joints Using ASTM A325 or A490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened unless indicated otherwise on the drawings or where pretension or slip critical joints are recommended or required by RCSC or AISC.
 - 2. Do not enlarge holes in members by burning or by using drift pins. Ram holes that must be enlarged to admit bolts.
- C. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
 - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- D. Adhesive Anchor Bolt Anchoring System Installation:
 - 1. General: Install adhesive anchors in strict accordance with manufacturer's instructions and in accordance with the following.
 - 2. Drilling Holes: Use rotary hammer-type drill and make drill holes to the required diameter and depth as consistent with anchor manufacturer's instructions for size of anchors being installed,
 - a. Prior to setting cartridge and anchor rod clean drilled holes free of loose material by vacuum process, finishing with a blast of compressed air and cover hole until actual use.
 - 3. Anchor Rod Installation: Following cartridge installation in prepared drill holes, set anchor rod to the required depth. Set anchor rods truly perpendicular (normal) to the base plate of item being anchored.
- E. Headed Stud Anchors:
 - 1. Welding Specifications: All materials shall be clean, dry and free of paint, rust, oil or other contaminants. Test welding should be done in the same

position being used for production. Test welds, after cooling, should be bent by hammer 45° from the vertical position without failure. Non-failure of two studs indicates that the weld setup is satisfactory and production welding may be started.

2. Inspection Requirements: After welding, the ceramic ferrule should be removed from each stud and the weld fillet visually inspected. A fillet of less than 360° is cause for further inspection. Such studs should be hammer tested, bending the stud 15° from the vertical toward the closest end of the embedment plate or steel member. Bending without failure indicates a satisfactory weld. Bent studs may be left bent unless stud projects into concrete cover or obstructs other materials. All bending and straightening when required shall be done without heating before completion of the production stud welding operation.
3. Do not weld studs to steel plates or members with temperatures below 32° F. Welding shall not be done when the steel surface is wet or exposed to rain or snow.
4. The Engineer reserves the right to require the Contractor to repair any welds, which are not a complete 360°, weld at no additional cost. The Engineer also reserves the right to require replacement of studs and the repair of the base metal at no additional cost. Any additional testing and inspection required will be at no additional cost to the Owner.

3.06 FIELD QUALITY CONTROL:

- A. Testing Agency: Owner will engage a qualified independent testing and inspection agency to inspect field welds and high-strength bolted connections.
 1. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations there from.
 2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
 3. Testing agency may inspect structural steel at plant before shipment.
- B. Bolted Connections: Field and shop-bolted connections will be inspected according to RSCS's "Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- C. Welded Connections: Inspect and test during erection of structural steel as follows:
 1. Review welder's certifications and certify welders if required. Conduct inspections and tests as required. Record types and locations of defects found in the work. Record work required and performed to correct deficiencies.
 2. All field welds will be visually inspected according to AWS D1.1.
 3. Test all full penetration welds using ultrasonic inspection methods in accordance with ASTM E164.

- 4. Perform magnetic particle inspection in accordance with ASTM E709 on at least 20% of fillet welds. Magnetic particle inspection shall be performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - D. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.
- 3.07 FIELD TOUCH-UP PAINTING OF SHOP PRIMER PAINTED STEEL AND GALVANIZED STEEL:
- A. General: Immediately after erection, clean field welds, bolted connections, and other surfaces required to be painted. Apply paint to areas required to be painted using same material as used for shop painting. Apply by brush or spray to provide minimum dry film thickness specified in Part 2 of this Section for the shop-applied coat.
 - B. Touch-up paint welded connections after the connections have passed the specified structural tests and inspections.
 - C. Do not paint when ambient temperature is below 40 degrees F, or when conditions differ from paint manufacturer's recommendations, as approved by the Engineer.
 - D. Touch up damaged galvanizing with zinc-rich paint in accordance with ASTM A 780 and manufacturer's written instructions.

END OF SECTION