CONTRACT DOCUMENTS
FOR

BUHR POOL AND ICE ARENA BARRIER FREE ACCESS IMPROVEMENTS

Due: Thursday, February 18, 2010

ITB 4069

PARKS AND RECREATION

CITY OF ANN ARBOR
100 North Fifth Avenue
Ann Arbor, Michigan 48104

Version 06/2004

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ADVERTISEMENT FOR
FOR THE
CITY OF ANN ARBOR, MICHIGAN

BID NO. 4069

Sealed Bids will be received by the Procurement Division, Fifth Floor, City Hall, on or before 2:00 p.m. Thursday, February 18, 2010 for barrier free improvements to Buhr Park Pool and Ice Arena. Bids will be publicly opened and read aloud at this time.

Work to be done includes removing the existing steps, portions of concrete sidewalk and part of the plaza, and installing a barrier free sloping sidewalk, part of the concrete sidewalk and asphalt patching of the parking lot. Bid documents may be obtained on or after Monday, February 1, 2010. Bid specifications are entirely downloadable at Michigan Intergovernmental Trade Network/BidNet (MITN) at www.govbids.org and on the Purchasing page of the City of Ann Arbor's website at www.a2gov.org.

Each proposal shall be accompanied by a certified check, or Bid Bond by a recognized surety, in the amount of 5% of the total of the bid price. A proposal, once submitted, becomes the property of the City. In the sole discretion of the City, the City reserves the right to allow a bidder to reclaim submitted documents provided the documents are requested and retrieved no later than 48 hours prior to the scheduled bid opening.

The successful Bidder will be required to furnish satisfactory performance and labor and material bonds in the amount of 100% of the bid price and satisfactory insurance coverage.

Precondition for entering into a contract with the City of Ann Arbor is compliance with Chapter 112 of Title IX of the Code of the City of Ann Arbor. The successful Bidder may also be required to comply with Chapter 23 of Title I of the Code of the City of Ann Arbor. Further information is outlined in the contract documents.

After the time of opening, no Bid may be withdrawn for a period of 45 days. The City reserves the right to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

Any further information may be obtained from the Procurement Division, (734) 794-6500 ext.45206.

CITY OF ANN ARBOR, MICHIGAN

→ *RATE EFFECTIVE APRIL 30, 2009*←

LIVING WAGE ORDINANCE – CITY OF ANN ARBOR

$11.71 per hour
if the employer provides health care benefits*****

$13.06 per hour
if the employer does ***NOT*** provide health care benefits*****

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than $10,000 in a twelve-month period of time ***must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.***

ENFORCEMENT

1.1 THE CITY OF ANN ARBOR MAY RECOVER BACK WAGES EITHER ADMINISTRATIVELY OR THROUGH COURT ACTION FOR THE EMPLOYEES THAT HAVE BEEN UNDERPAID IN VIOLATION OF THE LAW. PERSONS DENIED PAYMENT OF THE LIVING WAGE HAVE THE RIGHT TO BRING A CIVIL ACTION FOR DAMAGES IN ADDITION TO ANY ACTION TAKEN BY THE CITY.

Violation of this Ordinance is punishable by fines of not more than $500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

**** Health Care benefits includes those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed $.50 an hour for an average work week; and the employer cost or contribution must equal no less than $1/hr for the average work week.***

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

For Additional Information or to File a Complaint Contact:

Dee Lumpkin, Procurement Assistant
734/794-6576 or dlumpkin@a2gov.org

CITY OF ANN ARBOR PROCUREMENT OFFICE
HUMAN RIGHTS CONTRACT COMPLIANCE FORM

Form #1

Entire Organization (Totals for All Locations where applicable)

Name of Company/Organization_____ Date Form Completed_____

Name and Title of Person Completing this Form_____ Name of President _____

Address_____ County_____ Phone #_____
(Street address) (City) (State) (Zip) (Area Code)

Fax#_____ Email Address_____
(Area Code)

EMPLOYMENT DATA

Job Categories	Number of Employees (Report employees in only one category)												
	Male						Female						
	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaska Native	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaskan Native	TOTAL COLUMNS A-M
	A	B	C	D	F	G	H	I	J	K	L	M	
Exec/Sr. Level Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

Questions about this form? Call Procurement Office: (734) 794-6500 ext. 45206

CITY OF ANN ARBOR PROCUREMENT OFFICE **Form #2**

HUMAN RIGHTS CONTRACT COMPLIANCE FORM

Local Office (Only those employees that will do local or on-site work, if applicable)

Name of Company/Organization_____ Date Form Completed_____

Name and Title of Person Completing this Form_____

Fax#_____ Email Address_____
(Area Code)

EMPLOYMENT DATA

Job Categories	Number of Employees (Report employees in only one category)												
	Male						Female						
	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaska Native	White	Black or African American	Asian	Hispanic or LatinO	Native Hawaiian or Other Pacific Islander	American Indian or Alaskan Native	TOTAL COLUMNS A-M
	A	B	C	D	F	G	H	I	J	K	L	M	
Exec/Sr. Level Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

Questions about this form? Call Procurement Office: (734) 794-6500 ext. 45206

City of Ann Arbor LIVING WAGE ORDINANCE
DECLARATION OF COMPLIANCE

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that employers providing services to the City or recipients of grants for financial assistance (in amounts greater than $10,000 in a twelve-month period of time) pay their employees who are working on the City project or grant, a minimum level of compensation known as the **Living Wage**. This wage must be paid to the employees for the length of the contract/project.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from the Ordinance. If this exemption applies to your firm, please check below:

_____This company is exempt due to the fact that we employ or contract with fewer than 5 individuals.

_____ This non-profit agency is exempt due to the fact that we employ or contract with fewer than 10 employees.

The Ordinance requires that all contractors/vendors and/or grantees agree to the following terms:

a) To pay each of its employees performing work on any covered contract or grant with the City, no less than the living wage, which is defined as $11.71/hour when health care is provided, or no less than $13.06/hour for those employers that do *not* provide health care. It is understood that the Living Wage will be adjusted upward each year on April 30, and covered employers will be required to pay the adjusted amount thereafter. The rates stated above include the adjustment for 2009.

b) Please check the boxes below which apply to your workforce:

☐ Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage without health benefits Yes_____ No_____

OR

☐ Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage with health benefits Yes_____ No_____

c) To post a notice approved by the City regarding the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.

d) To provide the City payroll records or other documentation as requested; and,

e) To permit access to work sites to City representatives for the purposes of monitoring compliance, investigating complaints or non-compliance.

The undersigned authorized representative hereby obligates the contractor/vendor or grantee to the above stated conditions under penalty of perjury and violation of the Ordinance.

Company Name	Address City State Zip
Signature of Authorized Representative	Phone (area code)
Type or Print Name and Title	Email address
Date signed	

Questions about this form? Please contact: Procurement Office City of Ann Arbor
Phone: 734/794-6576 Fax:734/994-1795

- Effective February 1, 2010-

CITY OF ANN ARBOR RESOLUTION R-09-459
CUB AGREEMENT REQUIREMENT

NOTICE TO ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING CONSTRUCTION WORK FOR THE CITY OF ANN ARBOR ON ANY CITY CONSTRUCTION PROJECT

Any labor used on a City construction project bid and awarded by the City of Ann Arbor must be governed by the current collective bargaining agreement of the appropriate Local Unions of the Washtenaw County Skilled Building Trades Council (SBTC).

All invitations to bid on construction contracts include, as a condition of award, the requirement that all contractors and subcontractors execute a CUB agreement with the SBTC. Each contractor and subcontractor at all tiers of a project shall, prior to beginning work on the project, become signatory parties to the respective current collective bargaining agreements of the appropriate Local Unions of the SBTC. Alternately, when no other agreement exists, a Contractor may sign a one-time project agreement for the CUB project, covering that construction project only.

All potential bidders and contractors must contact the current CUB representative, Bart Nickerson at 734-944-5317 (office) or 734-320-2227 (cell) for a complete summary of the procedures and requirements pursuant to the CUB Memorandum of Understanding

CONTRACTORS SHALL DISPLAY THIS NOTICE WHERE EMPLOYEES CAN READILY SEE IT.

Questions Contact

D. Lumpkin, Procurement Assistant
dlumpkin@a2gov.org

MEMORANDUM OF UNDERSTANDING

1. WORK DISPUTES

In return for the promise made in paragraph (3) below, the parties agree that there will be no strike, work stoppage or lock-out for the duration of this Memorandum. Any jurisdictional dispute shall be resolved through normal procedures.

There will be a job conference with all contractors and sub-contractors prior to starting work.

2. COFFEE BREAKS

There shall be no organized coffee breaks.

3. PAYMENT OF FRINGES

Any Union having a claim against a contractor or subcontractor for unpaid wages and/or fringe benefits for work performed on the project shall give written notice of such claim to such contractor or subcontractor (with a copy of the notice to the Construction Manager or General Contractor) within three (3) business days after such claim has become known. Upon receipt of such written notice, the Construction Manager or General Contractor involved shall withhold an amount equal to the claim from the next disbursement payable to the contractor, pending resolution of the dispute satisfactory to the Construction Manager or General Contractor. In the event of any such dispute, the Union agrees to use its best efforts to pursue any legal remedies available, including litigation by Fund Trustees. It is understood that the intent to this section is to accomplish prompt and effective resolution of any disputes between the Union and any contractor or subcontractor over payment of wages and fringes.

4. UNION WORK

The parties understand and agree that each contractor and subcontractor at all tiers of this project shall, prior to beginning work on the project, become signatory parties to the respective current collective bargaining agreements of the appropriate Local Unions of the Washtenaw County Skilled Building Trades Council.

_____	_____
(Contractor, Owner or Construction Manager)	(Representative of Washtenaw County Skilled Building Trades Council)
_____	_____
_____	_____
_____	_____
_____	_____
(Project Description)	(Date)

THIS MEMORANDUM APPLIES ONLY TO THE PROJECT AND/OR CONSTRUCTION ABOVE DESCRIBED.

WHITE — Union Copy
GREEN — Contractor or Construction Manager Copy
CANARY - Owner Copy
PINK — CUB Copy
GOLD — Project Copy

Printed On Site

NOTICE OF PRE-BID CONFERENCE

A pre-bid meeting will be held on Tuesday, February 9, 2010 at 8:00 a.m. at Buhr Park Pool and Ice Arena, 2751 Packard Road, Ann Arbor.

General questions concerning the project should be directed to Amy Kuras, Park Planner at akuras@a2gov.org. Architectural/design questions should be directed to Mark Borys at Mitchell and Mouat Architects mborys@mitchellandmouat.com

INSTRUCTIONS TO BIDDERS

General

Work to be done under this Contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents. All work to be done under this Contract is located in or near the City of Ann Arbor.

The City shall make available to all prospective Bidders, prior to receipt of the Bids, access to the area in which the work is to be performed. Advance notice should be given to the Administering Service Area/Unit in cases where access to the site must be arranged by the City.

Any proposal which does not conform fully with these instructions may be rejected.

Proposals

Proposals must be submitted on the "Proposal Forms" and "Bid Forms" provided , with each blank properly filled in. **Three copies of the Proposal, Bid Forms and CUB Agreement must be provided. Please include one copy of the Human Rights Forms**. Sealed proposals will be received by the City of Ann Arbor Procurement Division, Fifth Floor, City Hall, Ann Arbor, Michigan, at the time stipulated in the Advertisement, promptly after which proposals will be publicly opened and read aloud. Each proposal must be enclosed in a sealed envelope, endorsed across one end:

BID #4069, Buhr Park Pool and Ice Arena Barrier Free Access Improvements

The City intends to award a Contract(s) to the lowest responsible Bidder(s). On multi-divisional contracts, separate divisions may be awarded to separate Bidders. The City may also utilize discounts offered in the Bid Forms, if any, to determine the lowest responsible Bidder on each division, and award multiple divisions to a single Bidder, so that the lowest total cost is achieved for the City. For unit price bids, the contract will be awarded based upon the lump sum and unit prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the City. If the City determines that the unit price for any item is materially different for the work item bid than either other bidders or the general market, the City, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

The acceptability of major subcontractors will be considered in determining if a Bidder is responsible. In comparing proposals, the City will give consideration to alternate proposals for items listed in the forms, or other alternates which the Bidder may wish to submit, but preference will be given to Base Bid Proposals.

The City reserves the right to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

Bid Security

Each proposal must be accompanied by a certified check, or Bid Bond by a surety licensed and authorized to do business within the State of Michigan, in the amount of 5% of the total of the bid price.

Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of days specified in the Advertisement.

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated on page C-1, Article III of the Contract. If these time requirements can not be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given on page C-2, Article III of the Contract, provides that the Contractor shall pay the City as liquidated damages, and not as a penalty, a certain sum per day for each and every day that the Contractor may be in default of completion of the specified work, within the time(s) stated in the Contract, or written extensions.

Liquidated damages clauses, as given in the General Conditions, provide further that the City shall be entitled to impose and recover liquidated damages for breach of the obligations under Chapter 112 of the City Code.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Human Rights Information

Section 5, beginning at page GC-3, outlines the requirements for fair employment practices under City of Ann Arbor Contracts. To establish compliance with this Ordinance, the Bidder must complete and return with its bid completed copies of the Human Rights Division Contract Compliance Forms (copy attached) or an acceptable equivalent.

Wage Requirements

Section 4, beginning at page GC-1, outlines the requirements for payment of prevailing wages or of a 'living wage' to employees providing service to the City under this contract. In addition Section 4 outlines the requirement for execution of a CUT Agreement with the Washtenaw County Skilled Building Trades Council (SBTC). The successful bidder must comply with all applicable requirements and provide documentary proof of compliance when requested.

Major Subcontractors

The Bidder shall identify each major subcontractor it expects to engage for this Contract if the work to be subcontracted is 15% or more of the bid sum or over $50,000, whichever is less. The Bidder also shall identify the work to be subcontracted to each major subcontractor.

PROPOSAL

City of Ann Arbor
Guy C. Larcom Municipal Building
Ann Arbor, Michigan 48107

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including Advertisement, Human Rights Division Contract Compliance Forms, CUB Agreement, Notice of Pre-Bid Conference, Instructions to Bidders, Proposal, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans and understands them. The Bidder declares that it conducted a full investigation at the site and of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance. The Bidder also declares that it has extensive experience in successfully completing projects similar to this one.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the City of Ann Arbor, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

The undersigned proposes to perform all work shown on the plans or described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, and other means of construction to do all the work, furnish all the materials, and complete the work in strict accordance with all terms of the Contract of which this proposal is one part.

In accordance with these bid documents, and Addenda numbered _____, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

The Bidder declares that it has become fully familiar with the provisions of the Ann Arbor City Council Resolution R-09-459, and that it understands and agrees that any labor used on this Bid to be awarded by the City shall be governed by the current collective bargaining agreement of the appropriate Labor Unions of the Washtenaw County Skilled Building Trades Council (SBTC). The Bidder further acknowledges and agrees that if awarded the bid, Bidder, and any and all subcontractors employed by it in performance of contract shall as a condition of award be required to execute a CUB Agreement with SBTC. Bidder further agrees that the cited City Council Resolution forms a part of this Contract.

The Bidder declares that it has become fully familiar with the liquidated damage clauses for completion times and for compliance with City Code Chapter 112, understands and agrees that the liquidated damages are for the non-quantifiable aspects of non-compliance and do not cover actual damages that may be shown and agrees that if awarded the Contract, all liquidated damage clauses form part of the Contract.

The Bidder declares that it has become fully familiar with the provisions of Chapter 14, Section 1:319 (Prevailing wages) and Chapter 23 (Living Wage) of the Code of the City of Ann Arbor and that it understands and agrees to comply, to the extent applicable to employees providing services to the City under this Contract, with the wage and reporting requirements stated in the City Code provisions cited. Bidder further agrees that the cited provisions of Chapter 14 and Chapter 23 form part of this Contract.

The Bidder encloses a certified check or Bid Bond in the amount of 5% of the total of the Bid Price. The Bidder agrees both to contract for the work and to furnish the necessary Bonds and insurance documentation within 10 days after being notified of the acceptance of the Bid.

If this Bid is accepted by the City and the Bidder fails to contract and furnish the required Bonds and insurance documentation within 10 days after being notified of the acceptance of this Bid, then the Bidder shall be considered to have abandoned the Contract and the certified check or Bid Bond accompanying this Proposal shall become due and payable to the City.

If the Bidder enters into the Contract in accordance with this Proposal, or if this Proposal is rejected, then the accompanying check or Bid Bond shall be returned to the Bidder.

In submitting this Bid, it is understood that the right is reserved by the City to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

SIGNED THIS _____ DAY OF _____, 2010.

Bidder's Name

Official Address

Authorized Signature of Bidder

Telephone Number

(Print Name of Signer Above)

LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form and strike out the other two.)

Bidder declares that it is:

* A corporation organized and doing business under the laws of the state of _____, for whom _____, bearing the office title of _____, whose signature is affixed to this proposal, is authorized to execute contracts.

* A partnership, list all members and the street and mailing address of each:

Also identify the County and State where partnership papers are filed:

County of _____, State of

* An individual, whose signature with address, is affixed to this proposal:

(initial)

BID FORM

NAME OF BIDDER _____

STREET ADDRESS _____

CITY, STATE, ZIP _____

TEL NO. _____ FAX _____ **E-mail:** _____

FEDERAL ID #_____

We, the undersigned, will furnish all labor, materials, equipment, services, facilities and all other items required for the **Buhr Park Pool and Ice Arena Barrier Free Access Improvements** project as defined by the Drawings and Specifications herein attached and referenced. This **BASE BID** amount is being submitted in accordance with the Documents and Specifications prepared by:

Mitchell and Mouat architects

as identified by MaMA Project No. **0911** and City of Ann Arbor ITB 4069 for the amount of:

_____ DOLLARS ($_____)

BONDS

A **Bid Bond** (5% of bid amount) in the amount of $_____ has **been attached** and forms part of this proposal. The method selected by the Bidder for the Bid Bond will be _____.

A **Performance and Labor and Material Bond** will be furnished as indicated in the Invitation to Bid. The premium for the assurance of this project will be $_____, and is part of the lump sum above. The bonds are to be submitted on the City's bond forms provided with this bid. AIA forms will NOT be accepted.

ADDENDA

We acknowledge receipt of the following Addenda that are included in our bid:

Addendum No. _____ , Dated _____ Addendum No._____ , Dated _____

Addendum No. _____ , Dated _____ Addendum No._____ , Dated _____

PREPARATION OF BIDS

Proposals shall be based upon these Instructions, the General and Supplemental Conditions (if applicable) and the General Requirements (if applicable) as Part of the Construction Documents.

WORK AND OCCUPANCY COORDINATION

We have reviewed and, by initialing below, indicate that we will fully comply with the requirements of the "Summary of the Work" pertaining to work and occupancy coordination – as applicable. Initial:_____

CHANGES TO WORK

For additions or deletions to work performed upon the authorization of Owner, Bidder agrees to accept the following fees:
1. For work performed by our own forces, an add/deduct of 15% of cost/credit will be included.
2. For work performed by subcontractors, an add/deduct of 7.5% of cost/credit will be included.

TIME OF COMPLETION

If awarded the Contract, we agree to complete the work described in the Contract Documents within _____ days after award, based on straight time performance of work.

PROPOSAL GUARANTEE

The price stated in this Proposal is guaranteed for a period of not less than forty-five (45) days, and, if authorized to proceed within that period, we agree to complete the work covered by this proposal at said price.

UNIT PRICES

Refer to **Section 00910 – UNIT PRICES** to be attached to this Bid Form (if applicable).

ALTERNATES

Refer to **Section 00920 – ALTERNATES** to be attached to this Bid Form.

INFORMATION REQUIRED

Bidder to state if individual, partnership, or corporation: _____

1. If partnership, list names of all partners:_____

   _____

2. If corporation:

   (A) Give state of incorporation: _____

   (B) Give states in which qualified to do business: _____

_____
_____
NAME OF BIDDER SIGNED BY

_____
_____
TITLE DATE

_____
HOME OFFICE ADDRESS OF BIDDER

Please enclose three (3) copies of this Form , the CUB agreement, the Human Rights Forms and the Proposal Section as your Bid. Attach copies of Specification Section(s) 00910 and/or 00920 and/or 00930 as Applicable.

Section 2 - Material and Equipment Alternates

The Base Bid proposal price shall include materials and equipment selected from the designated items and manufacturers listed in the bidding documents. This is done to establish uniformity in bidding and to establish standards of quality for the items named.

If the Contractor wishes to quote alternate items for consideration by the City, it may do so under this Section. A complete description of the item and the proposed price differential must be provided. Unless approved at the time of award, substitutions where items are specifically named will be considered only as a negotiated change in Contract Sum.

Item Number	Description	Add/Deduct Amount

If the Bidder does not suggest any material or equipment alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any material or equipment alternate under the contract.

Signature of Authorized Representative of Bidder

Section 3 - Time Alternate

If the Bidder takes exception to the time stipulated in Article III of the Contract, Time of Completion, page C-1, it is requested to stipulate below its proposed time for performance of the work. Consideration will be given to time in evaluating bids.

If the Bidder does not suggest any time alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any time alternate under the contract.

Signature of Authorized Representative of Bidder

BID FORM

Section 4 - Major Subcontractors

For purposes of this contract, a Subcontractor is anyone (other than the Contractor) who performs work (other than or in addition to the furnishing of materials, plans or equipment) at or about the construction site, directly or indirectly for or on behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any individual who furnishes merely the individual's own personal labor or services.

For the work outlined in these documents the Bidder expects to engage the following major subcontractors to perform the work identified and warrants that any subcontractor identified shall as a condition of employment execute a CUB Agreement with the Washtenaw County Skilled Building Trades Council:

Subcontractor (Name and Address)	Work	Amount

If the Bidder does not expect to engage any major subcontractor, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT expect to engage any major subcontractor to perform work under the contract.

Signature of Authorized Representative of Bidder

CONTRACT

THIS AGREEMENT is made on the 5th day of May, 2009, between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 100 N. Fifth Avenue, Ann Arbor, Michigan 48104 ('City') and _____ located at _____.

Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled '**Buhr Park Pool and Ice Arena Barrier Free Access Improvements, ITB #4069'** in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

Human Rights Division Contract Compliance Forms
Living Wage Declaration of Compliance Forms (if applicable)
CUB Agreement (if applicable)
Bid Forms
Proposal

Contract and Exhibits
Bonds
General Conditions
Standard Specifications
Detailed Specifications
Plans
Addenda

ARTICLE II - Definitions

Administering Service Area/Unit means Community Services Area
Supervising Professional means _____ or other persons acting under the authorization of the Administrator/Manager of the Administering Service Area/Unit.

Project means '**Buhr Pool and Ice Arena Barrier Free Access Improvements, ITB 4069**'

ARTICLE III - Time of Completion

(A) The work to be completed under this Contract shall begin immediately after the Contractor's receipt of a fully executed Contract.

A. (B) The entire work for this Contract shall be completed in 45 consecutive calendar days. Shorter completion times for certain portions of the work are specified in the Detailed Specifications. The Work associated with this Project shall be accomplished starting after the closure of the ice arena early April and completed prior to May 28th, 2010.

Specific Dates for the project completion are noted in the contract documents

(C) Failure to complete all the work within the time specified above, including any

extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to $200.00 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

As an independent requirement, where the Detailed Specifications identify certain portions of the work to be completed within a shorter period of time and the Contractor fails to complete each portion within the shorter period specified for each portion, including any extension granted in writing by the Project Supervisor, the City is entitled to deduct from the monies due the Contractor, as liquidated damages and not as a penalty, the amount identified in the Detailed Specifications for each portion of the work not timely completed for each calendar day of delay in completion of each portion of the work.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Liquidated damages under this section are in addition to any liquidated damages due under Section 5 of the General Conditions.

ARTICLE IV - The Contract Sum

(A)The City shall pay to the Contractor for the performance of the Contract, the lump sum price as given in the Bid Forms for the estimated total of:

_____ **Dollars** **($_____)**
use words use numbers

(B)The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the contract documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract may not be assigned or subcontracted without the written consent of the City.

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this agreement, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract.

Whenever possible, each provision of the contract will be interpreted in a manner as to be effective

and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a contract of employment but is a contract to accomplish a specific result. Contractor is an independent contractor performing services for the City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this agreement.

ARTICLE VIII - Notice

All notices given under this contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the contract documents or other address the Contractor may specify in writing..

ARTICLE IX - Indemnification

To the fullest extent permitted by law, for any loss not covered by insurance under this contract, Contractor shall indemnify, defend and hold harmless the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this contract, by the Contractor or anyone acting on the Contractor's behalf under this contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations or agreements whether written or oral. Neither party has relied on any prior representations in entering into this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

FOR CONTRACTOR

By_____

FOR THE CITY OF ANN ARBOR

By_____
John Hieftje, Mayor

By_____
Jacqueline Beaudry, City Clerk

Approved as to substance

By_____
Roger W. Fraser, City Administrator

By_____
Sumedh Bahl, Acting Community Services
Service Area Administrator

Approved as to form and content

_____

Stephen K. Postema, City Attorney

PERFORMANCE BOND

(1) _____ of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for

$ _____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written contract with the City dated _____, 20__, for:

_____ and this bond is given for that contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.

(3) Whenever the Principal is declared by the City to be in default under the contract, the Surety may promptly remedy the default or shall promptly:

(a) complete the contract in accordance with its terms and conditions; or

(b) obtain a bid or bids for submission to the City for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.

(4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the contract.

(5) Surety agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work, or to the specifications.

SIGNED AND SEALED this _____ day of _____, 2010.

(Name of Surety Company)

By
(Signature)

Its
(Title of Office)

(Name of Principal)

By
(Signature)

Its
(Title of Office)

Name and address of agent:

Approved as to form:

Stephen K. Postema, City Attorney

LABOR AND MATERIAL BOND

(1) _____ of _____, (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of

$ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written contract with the City, dated _____, 20__, for _____; and this bond is given for that contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;

(3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the contract, the Surety shall pay those claimants.

(4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

SIGNED AND SEALED this _____ day of _____, 2010.

(Name of Surety Company)

By
(Signature)

Its
(Title of Office)

(Name of Principal)

By
(Signature)

Its
(Title of Office)

Approved as to form:

Stephen K. Postema, City Attorney

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 3 copies by the City and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Proposal.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the City upon discovery, and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section."

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

Further, to the extent that any employees of the Contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with Section 1:319 of Chapter 14 of Title I of the Code of the City of Ann Arbor, the Contractor agrees to conform to Chapter 23 of Title I of the Code of the City of Ann Arbor, as amended, which in part states:

1:814. Applicability.

(1) This Chapter shall apply to any person that is a contractor/vendor or grantee as defined in Section 1:813 that employs or contracts with five (5) or more individuals; provided, however, that this Chapter shall not apply to a non-profit contractor/vendor or non-profit grantee unless it employs or contracts with ten (10) or more individuals.

(2) This Chapter shall apply to any grant, contract, or subcontract or other form of financial assistance awarded to or entered into with a contractor/vendor or grantee after the effective date of this Chapter and to the extension or renewal after the effective date of this Chapter of any grant, contract, or subcontract or other form of financial assistance with a contractor/vendor or grantee.

1:815. Living Wages Required.

(1) Every contractor/vendor or grantee, as defined in Section 1:813, shall pay its covered employees a living wage as established in this Section.

(a) For a covered employer that provides employee health care to its employees, the living wage shall be $11.71 an hour, or the adjusted amount hereafter established under Section 1:815(3).

(b) For a covered employer that does not provide health care to its employees, the living wage shall be $13.06 a hour, or the adjusted amount hereafter established under Section 1:815(3).

(2) In order to qualify to pay the living wage rate for covered employers providing employee health care under subsection 1:815(1)(a), a covered employer shall furnish proof of said health care coverage and payment therefore to the City Administrator or his/her designee.

(3) The amount of the living wage established in this Section shall be adjusted upward no later than April 30, 2010, and every year thereafter by a percentage equal to the percentage increase, if any, in the federal poverty guidelines as published by the United States Department of Health and Human Services for 2009. Subsequent annual adjustments shall be based upon the percentage increase, if any, in the United States Department of Health and Human Services poverty guidelines when comparing the prior calendar year's poverty guidelines to the present calendar year's guidelines. The applicable percentage amount will be converted to an amount in cents by multiplying the existing wage under Section 1.815(1)(b) by said percentage, rounding upward to the next cent, and adding this amount of cents to the existing living wage levels established under Sections 1:815(1)(a) and 1:815(1)(b). Prior to April 1 of each calendar year, the City will notify any covered employer of this adjustment by posting a written notice in a prominent place in City Hall, and, in the case of a covered employer that has provided an address of record to the City, by a written letter to each such covered employer.

Section 5 - Non-Discrimination

The Contractor agrees to comply with the nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code and to take affirmative action to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate any inequality based upon race, national origin or sex. The Contractor agrees to comply with the provisions of Section 9:161 of Chapter 112 of the Ann Arbor City Code and in particular the following excerpts:

9:161 NONDISCRIMINATION BY CITY CONTRACTORS

(1) All contractors proposing to do business with the City of Ann Arbor shall satisfy the nondiscrimination administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All contractors shall receive approval from the Director prior to entering into a contract with the City, unless specifically exempted by administrative policy. All City contractors shall take affirmative action to insure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon race, national origin or sex.

(2) Each prospective contractor shall submit to the City data showing current total employment by occupational category, sex and minority group. If, after verifying this data, the Director concludes that it indicates total minority and female employment commensurate with their availability within the contractor's labor recruitment area, i.e., the area from which the contractor can reasonably be expected to recruit, said contractor shall be accepted by the Director as having fulfilled affirmative action requirements for a period of one year at which time the Director shall conduct another review. Other contractors shall develop an affirmative action program in conjunction with the Director. Said program shall include specific goals and timetables for the hiring and promotion of minorities and females. Said goals shall reflect the availability of minorities and females within the contractor's labor recruitment area. In the case of construction contractors, the Director shall use for employment verification the labor recruitment area of the Ann Arbor-Ypsilanti standard metropolitan statistical area. Construction contractors determined to be in compliance shall be accepted by the Director as having fulfilled affirmative action requirements for a period of six (6) months at which time the Director shall conduct another review.

(3) In hiring for construction projects, contractors shall make good faith efforts to employ local persons, so as to enhance the local economy.

(4) All contracts shall include provisions through which the contractor agrees, in addition to any other applicable Federal or State labor laws:

(a) To set goals, in conference with the Human Resources Director, for each job category or division of the work force used in the completion of the City work;

(b) To provide periodic reports concerning the progress the contractor has made in meeting the affirmative action goals it has agreed to;

(c) To permit the Director access to all books, records and accounts pertaining to its employment practices for the purpose of determining compliance with the affirmative action requirements.

(5) The Director shall monitor the compliance of each contractor with the nondiscrimination provisions of each contract. The Director shall develop procedures and regulations consistent with the administrative policy adopted by the City Administrator for notice and enforcement of non-compliance. Such procedures and regulations shall include a provision for the posting of contractors not in compliance.

(6) All City contracts shall provide further that breach of the obligation not to discriminate shall be a material breach of the contract for which the City shall be entitled, at its option, to do any or all of the following:

(a) To cancel, terminate, or suspend the contract in whole or part and/or refuse to make any required periodic payments under the contract;

(b) Declare the contractor ineligible for the award of any future contracts with the City for a specified length of time;

(c) To recover liquidated damages of a specified sum, said sum to be that percentage of the labor expenditure for the time period involved which would have accrued to minority group members had the affirmative action not been breached;

(d) Impose for each day of non-compliance, liquidated damages of a specified sum, based upon the following schedule:

Contract Amount	Assessed Damages Per Day of Non-Compliance
$ 10,000 - 24,999	$ 25.00
25,000 - 99,999	50.00
100,000 - 199,999	100.00
200,000 - 499,999	150.00
500,000 - 1,499,999	200.00

1,500,000 - 2,999,999	250.00
3,000,000 - 4,999,999	300.00
5,000,000 - and above	500.00

(e) In addition the contractor shall be liable for any costs or expenses incurred by the City of Ann Arbor in obtaining from other sources the work and services to be rendered or performed or the goods or properties to be furnished or delivered to the City under this contract.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for

changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to it's work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

(1) When work under an extra work order is added to the work under this Contract;

(2) When the work is suspended as provided in Section 20;

(3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;

(4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;

(5) Delay due to an act of Government;

(6) Delay by the Supervising Professional in the furnishing of plans and necessary information;

(7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or

conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section l3. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

(1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;

(2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

(3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;

(4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;

(5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the

Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than l80 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within l0 days after written notice, the City may remove them and, if the removed material has value, may store the material at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

(1) The consent of the surety to payment of the final estimate;
(2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

(1) unsettled liens;
(2) faulty work appearing within 12 months after final payment;
(3) hidden defects in meeting the requirements of the plans and specifications;

(4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and The City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred.

The expense incurred by the City, and the damage incurred through the Contractor's default, shall be

certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days.

The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

(1) Defective work not remedied;

(2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;

(3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;

(4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself from all claims for bodily injuries, death or property

damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:

1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

   Bodily Injury by Accident - $500,000 each accident
   Bodily Injury by Disease - $500,000 each employee
   Bodily Injury by Disease - $500,000 each policy limit

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

   $1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.

   $2,000,000 Per Job General Aggregate

   $1,000,000 Personal and Advertising Injury

   $2,000,000 Products and Completed Operations Aggregate

3. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

4. Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

B. Insurance required under Section A.2 and A.3 of this Contract shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.

C. In the case of all Contracts involving on-site work, the Contractor shall provide to the City before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an

unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Service Area/Unit at least ten days prior to the expiration date.

D. Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of 'A' Overall and a minimum Financial Size Category of □V□. Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

(1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
(2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

Any night or weekend work must be approved by City Staff in writing prior to scheduling.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 2010, to _____, 20__, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled _____,for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

_____

Contractor Date

By
(Signature)

Its
(Title of Office)

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor,_____, represents that on , 20_____, it was awarded a contract by the City of Ann Arbor, Michigan to _____ under the terms and conditions of a Contract titled _____.
The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

Contractor

By _____
(Signature)

Its_____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 2010
_____ , _____ County, Michigan
Notary Public
My commission expires on: _____

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Advertisement. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

A copy of the Public Services Department Standard Specifications may be purchased from the Project Management Division, (Fourth Floor, City Hall, Ann Arbor, Michigan), for $35.00 per copy. In addition, a copy of these Standard Specifications is available for public viewing on the City of Ann Arbor Website:
www.a2gov.org/government/publicservices/project_management/privatedev/Pages/Standardspecificationbook.aspx

1.2 SECTION 00920 - ALTERNATES

PART 1 - GENERAL

A. An Alternate is an amount proposed by Bidders and stated on the Bid Form, or noted herein and attached to the Bid Form, for certain items that may be added to or deducted from Base Bid amount if the Owner decides to accept the corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
B. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the Project.
C. Notification: Immediately following Contract award, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates if applicable.
D. Schedule: An "**Alternate Schedule**" is included at the end of this Section.
   1. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.
   2. Specification Sections may be referenced in the Schedule and may contain requirements for materials and methods necessary to achieve the Work described under each alternate.
E. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies

PART 2 - EXECUTION

A. **The Contract Work may include all Alternates, which are listed below, and shall be appropriately included in the Base Bid and submitted as part of the complete scope of Work as described below**.
B. Provide all of the requested **Alternate** pricing.
   1. **Alternate** pricing shall be used to allow the **Owner** the option to add/delete work to the base construction pricing noted as Base Bid.
   2. The **Alternate** pricing shall be included in the Contract at the sole discretion of the **Owner** after the review of the budget and before awarding the contract.
3. Bid Proposals shall be ranked and evaluated by the Owner based on "Base Bid" pricing, and any modifications to rankings base on the acceptance or rejection of Alternates shall be at the discretion of the Owner.
4. **Included in the Alternate Bid shall be: labor, materials, equipment, services, facilities and all items required to complete the Work and/or as further indicated on the drawings and in the specifications.**

C. **Alternates Schedule follows on the next page. All ALTERNATE items shall be quoted herein and this Section shall be copied and attached to the Bid Form - 00300.The following Alternates Schedule shall be attached to the Bid Form – 00300 and submitted in triplicate as noted.**

PART 3 - ALTERNATES SCHEDULE:

1. **Add the Work** associated with removing the existing sidewalk, providing a base aggregate as required and extending the proposed sidewalk approx. 35 feet, including the Barrier-Free ramp and tactile warnings – as indicated in the Documents.

   #1 - ALTERNATE ADD COST $ _____

SECTION 01010 - SUMMARY OF THE WORK

PART 1 - GENERAL

1.01 DESCRIPTION OF THE PROJECT:

A. Provide all material and labor to complete the construction of Buhr Park – Site Renovation as described and intended by the complete body of work represented in these Contract Documents – including:
   1. Demolition of existing concrete/asphalt flatwork
   2. Sitework and excavation
   3. Foundations for new Stairways

B. The Work associated with this Project shall be accomplished starting approximately during the last week of March and completed prior to May 28th (Memorial Day). Coordinate with the City of Ann Arbor's Council Meeting Schedule for exact dates for Contract Approval.

1.02 DESCRIPTION OF CONTRACT REQUIREMENTS

A. Summary by Reference
   1. The work can be summarized by reference to the requirements of the various Contract Documents, which in turn make reference to the requirements of other applicable provisions which control or influence the work; and these references can be summarized but are not necessarily limited to the following:
      a. The Executed Owner-Contractor Agreement (typically not bound herewith).
      b. The General and Supplementary Conditions - which are bound herewith or included by reference in this project Manual.
      c. The Drawings - which are listed in the "Drawing Sheets" as of the date of these Contract Documents are attached.
      d. The Specification Sections - that are listed in the "Table of Contents" and bound herewith in this Project Manual.
      e. Any Addenda or Modifications to the Contract Documents, which may have been bound herewith (in this Project Manual) or distributed by transmittal subsequent to the binding hereof.
      f. Governing regulations, which have a bearing on the performance of the work; copies can be obtained from or reviewed at the local, State or Federal Agency responsible for the regulation in each case.
      g. Submittals (of every kind), copies of which are retained by the Contractor at the site.
      h. Miscellaneous elements of information having a bearing on the performance of the work, such as reports of general trade union negotiations: copies must be obtained by the Contractor through normal channels of information.

PART 2 - SPECIAL CONSIDERATIONS:

2.01 GENERAL:

A. All products incorporated into the building construction shall be asbestos free. Construction managers and/or contractors shall submit a signed and notarized statement to the Owner to this effect for incorporation into the asbestos management plan.

B. All painted/coated products and plumbing components incorporated into the building construction shall be lead free. Construction managers and/or contractors shall submit a signed statement to the Owner to this effect for incorporation into the lead inspection plan.

C. All adhesives, coatings and paints may not contain any Volatile Organic Compounds, unless a waiver is obtained from the Owner.

2.02 OCCUPANCY BY CONTRACTOR AND OWNER

A. Prior to March 21st and after and including May 25th the site will be available and in use by the Public.

2.03 WORK SEQUENCE and COORDINATION WITH OTHERS:

A. Outline Schedule:
   1. This Project is anticipated to consist of a single phase.
   2. All Bidders are to maintain a Construction Schedule that will meet the start and end dates noted herein.
   3. If no “end date” is noted, but the Contractor has submitted a number of days for construction on the Bid Form, the Contractor shall create and maintain a schedule that reflects their submitted time period.

B. Sequencing of the various elements of the work will be required and will be established at the Pre-Construction Conference based upon input from the Owner, Architect and all Contractors. The sequence, as it affects the Owner’s Occupancy, may be modified or adjusted at any time at the discretion of the Owner.

END OF SECTION 01010

SECTION 01019 - CONTRACT CONSIDERATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. In General - Particular requirements of the Contractor to complete appropriate Schedules, Applications and Forms as Records of the Project. The use of AIA documents is strongly encouraged. Any other proprietary forms should be approved by the Owner/Architect prior to be introduced into record by the Contractor.

B. Schedule of Values
C. Applications for Payment, including Substantial Completion
D. Project Change Procedures
E. Additional Information Available to Contractor

1.02 RELATED SECTIONS:

A. Section 00920 – Alternates
B. Section 01010 – Summary of Work
C. Section 01039 – Project Coordination
D. Section 01300 - Submittals
E. Section 01600 - Product Substitutions
F. Section 01700 – Contract Close-Outs

PART 2 - CONTRACT REQUIREMENTS:

2.01 SCHEDULE OF VALUES:

A. Submit a complete **Schedule of Values** in duplicate within 10 days after date of Owner-Contractor Agreement, unless requested previously by the Owner or Architect.
   1. The Schedule of Values shall be used as a basis for determining progress payments for the contract or any designated lump sum bid item, and shall be in such form and sufficient detail to correctly represent a reasonable apportionment of the Contract Sum.
   2. Each activity in the Schedule of Values shall delineate one construction activity. The costing for each activity should include all costs for the labor and materials or equipment required to complete the activity. The sum of the values for the construction activities, within a bid item, must equal the total bid amount for that item.
   3. Prior to submitting an Application for Payment, the Contractor shall have submitted a detailed Schedule of Values and obtained approval from the Owner/Architect.
B. Revise Schedule of Values to list approved Change Orders with each Application for Payment as the Project progresses.
C. The Contractor may be required to provide certification from the Subcontractors certifying the subcontract amounts.

2.02 APPLICATION FOR PAYMENT

A. Submit typed application on **AIA Form G702 - Application and Certificate for Payment,** including any required Continuation Sheets. Contractor's standard form or electronic media printout will be considered only if previously approved by the Architect.
B. Format:
   1. Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification section. Break subcontract amounts further into several line items which will indicate individual contractor work within each section as well as allowances. Identify site mobilization, bonds and insurance as separate line items at the top of this schedule.
   2. Break Contract Sum down in enough detail to facilitate evaluation of Applications for Payment at the discretion of the Architect/Owner.

3. Include each Allowance from Section 00930 – Allowances on the Schedule of Values within the amount for each related trade.
4. Include separately from each line item, a directly proportional amount of Contractor's overhead and profit.
5. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
6. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the period covered by the application.
7. All forms shall have a signature line for the Architect, for approval prior to submission to the Owner.
8. Provide 3 notarized originals for Architect's signature. After signing - one original will be retained by the Architect; one retained by the Owner; and one returned with the payment to the Contractor.

C. Payment Period: Typically - one calendar month.

D. Waiver of Liens shall be provided ascertaining payment to subcontractors of monies distributed from previous month's application.

E. Where deemed appropriate by the Owner, Applications for Payment shall be accompanied by certified payroll records to verify that Wage Decision Guidelines applicable to the project are being adhered to by the Contractor (where required herein these Documents).

F. **Initial Application for Payment**: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include:
1. List of subcontractors.
2. List of suppliers and fabricators.
3. Schedule of Values.
4. Contractor's Construction Schedule (preliminary if not final).
5. Submittal Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. Copies of building permits.
8. Copies of licenses from governing authorities.
9. Certificates of insurance and insurance policies.
10. Performance and payment bonds (if required).

G. **Final Payment Application** - Actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
1. Submission of **Certificate of Substantial Completion AIA G704**.
2. Completion of Project closeout requirements.
3. Completion of items specified for completion after Substantial Completion.
4. Transmittal of required Project construction records to the Owner.
5. Removal of surplus materials, rubbish and similar elements.
6. See **Section 01700 – Contract Close-outs** for additional information.

2.03 CHANGE PROCEDURES:

The following items describe the possible Requests for Information, Field Changes, and other subsequent procedures and documentation requirements involving the Work as authorized by AIA A201, 2007 Edition.

A. **Architectural Supplemental Instructions (ASI)** - The Architect may advise of minor changes in the work not involving an adjustment to Contract Sum or Contract Time as authorized by AIA A201, 2007 Edition, Paragraph 7.4 by issuing an **Architectural Supplemental Instructions (ASI) on AIA Form G710**.

B. **Proposal Request** - The Architect may issue a Request for Proposal (RFP) that includes a detailed description of a proposed change with supplementary or revised drawings and specifications. The Contractor shall prepare and submit an itemized quote within 10 working days. All quotes shall include detailed labor and materials costs from all related sub contractors, shall separately itemize the Contractor's overhead and profit, and shall indicate, with explanation, the associated affect on Project Schedule.

1. **Note: compensation for extended General Conditions is not considered customary and will be granted solely at the Owner's discretion.**
2. RFPs which are returned without full itemization shall be considered to be non-responsive. Delays resulting from the Architect or Owner's subsequent requests for itemization and the time taken to provide same shall be caused solely by the Contractor.

C. **The Contractor may propose a change** by submitting request for change to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the contract sum and contract time with full documentation document any requested substitutions in accordance with Section 01600.
   1. Comply with requirements in Section 01600 – Product Substitutions if the change requires substitution of one product or system for products or systems specified.

D. **Request for Information (RFI)** - The Contractor may submit a **Request for Information (RFI) G716**, which may generate a change in the Work as detailed by the Architect. All RFI's shall be generated by the General Contractor (or the Construction Manager) who shall coordinate all subcontractors and issue sequentially numbered documents. All RFI's shall provide the Architect with existing field conditions and/or possible resolutions to facilitate a prompt and effective response. It is the Contractor's responsibility to review the field issues, dimensions, conflicts, etc. to provide as much information as possible to the Architect for resolution. The Contractor shall take an active role in resolving these issues with the Architect.

E. **Construction Change Directives (CCD) –** the Architect may issue a directive, **on AIA Form G714 Construction Change Directive (CCD)**, that when signed by the Owner, instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The Document will describe changes in the Work, and designate method of determining any change in contract sum or contract time. Promptly execute the change when authorized by the Owner. Construction Change Directives may be issued in the field as a "Draft" which allows the Contractor to estimate the Work and/or cost as well as informing the contractor to allow for potential changes being issued.

F. **Time and Material Change Order (T&M – CO) –** It may be allowed by the Owner that Work be completed without a prior Cost Estimate. If allowed - submit itemized accounting and supporting data after completion of change, within time limits indicated in the conditions of the contract. Architect will determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents.
   1. Any Work done, as agreed to by the Owner/Architect/Contractor on a Time and Material Basis shall set special requirements of the Contractor. Maintain detailed records of work done on time and material (T&M) basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the work.

G. **Change Order Forms (CO)** – The Contractor shall prepare Change Orders, based on approved quotes from RFPs, using the **AIA G701 Change Order** form. Unless otherwise provided in the Conditions of the Contract, the Contractor shall distribute three signed originals to the Architect for approval and further distribution to the Owner.

H. **Allowance Adjustment:** Base each Change Order proposal request for an allowance cost adjustment on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections and similar margins.
   1. Include installation costs in the purchase amount only where indicated as part of the allowance.
   2. When requested, prepare explanations and documentation to substantiate margins claimed.
   3. Submit substantiation of a change in scope of work claimed in the change orders related to unit-cost allowances.
   4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure or count.

5. Submit claims for increased costs because of change in scope or nature of the allowance described in contract documents, whether for purchase amount or Contractor's handling, labor, installation, overhead and profit, within 20 days of receipt of change order or construction change directive authorizing work to proceed. Claims submitted later than 20 days will be rejected.
   a. Change order cost amount shall not include Contractor's or subcontractor's indirect expense except when clearly demonstrated that the nature or scope of work required was changed from what could have been foreseen from the allowance description and other information in contract documents.
   b. No change to the Contractor's indirect expense is permitted for selection of higher or lower priced materials or systems, of the same scope and nature as originally indicated.

2.04 PROVISION FOR ADDITIONAL INFORMATION:

A. Electronic media files (.DWG format) may be available as backgrounds for contractors requiring layout and detailing of Project Document information. These files may be requested of the Project Team by submitting the "***File Request Form"*** following this Section.

B. Only files created by **Mitchell and Mouat Architects** can be guaranteed to be available, but additional Consultant's files may be requested, and availability will be according to the Consultant's provisions and based upon their file format and other considerations.

C. See Specification **Section: 01020 – File Request Form** following for **information and fees** associated with the transfer and use of AutoCAD files for Contractor's use.

END OF SECTION 01019

SECTION 00920 - ALTERNATES

PART 1 - GENERAL

A. An Alternate is an amount proposed by Bidders and stated on the Bid Form, or noted herein and attached to the Bid Form, for certain items that may be added to or deducted from Base Bid amount if the Owner decides to accept the corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
B. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the Project.
C. Notification: Immediately following Contract award, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates if applicable.
D. Schedule: An "**Alternate Schedule**" is included at the end of this Section.
    1. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.
    2. Specification Sections may be referenced in the Schedule and may contain requirements for materials and methods necessary to achieve the Work described under each alternate.
E. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies

PART 2 - EXECUTION

A. **The Contract Work may include all Alternates, which are listed below, and shall be appropriately included in the Base Bid and submitted as part of the complete scope of Work as described below**.
B. Provide all of the requested **Alternate** pricing.
    1. **Alternate** pricing shall be used to allow the **Owner** the option to add/delete work to the base construction pricing noted as Base Bid.
    2. The **Alternate** pricing shall be included in the Contract at the sole discretion of the **Owner** after the review of the budget and before awarding the contract.
    3. Bid Proposals shall be ranked and evaluated by the Owner based on “Base Bid” pricing, and any modifications to rankings base on the acceptance or rejection of Alternates shall be at the discretion of the Owner.
    4. **Included in the Alternate Bid shall be: labor, materials, equipment, services, facilities and all items required to complete the Work and/or as further indicated on the drawings and in the specifications.**

C. **Alternates Schedule follows on the next page. All ALTERNATE items shall be quoted herein and this Section shall be copied and attached to the Bid Form - 00300.**

The following Alternates Schedule shall be attached to the Bid Form – 00300 and submitted in triplicate as noted.

PART 3 - ALTERNATES SCHEDULE:

End of Schedule

END OF SECTION 00920

SECTION 01031 - ALTERATIONS OF EXISTING WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

B. Removals:
   1. Removals shall be as indicated and as specified herein and in other sections of these Specifications and shall be performed in a neat and workmanlike manner to limits indicated or specified or to minimum extent necessary or required for proper installation of new work. Existing surfaces remaining after removals to which new work is to be applied shall be left in a condition suitable for application of new work.
   2. Removals shall be performed without damage to adjacent retained work; however, where such work is damaged, Contractor shall patch, repair or otherwise restore same to its original or better condition in terms of performance characteristics and visual effect.
   3. All existing materials, fixtures, and equipment which have been removed or disconnected, but which are not indicated or specified for reuse in new work or called for to be turned over to Owner shall become property of Contractor and shall be removed from site by Contractor at his expense and legally disposed of. On-site storage or sale of salvaged items not designated for Owner reuse will not be permitted.

C. Debris:
   1. Debris shall be placed in approved containers to prevent the spread and accumulation of dust and dirt. Debris shall be removed from the area of work as often as necessary, but not less than at least once at end of each work day. All such debris shall be removed from site by Contractor and legally disposed of.
   2. Construction areas, interior and exterior, must be kept in a neat and orderly fashion. Contractor shall interpret "neat and orderly" to be in excess of that which is the normal construction industry practice. Trash, debris and all unusable items must be removed from the site daily. Removal must be supervised.

D. Protection:
   1. Contractor shall take all necessary precautions to adequately protect personnel and public and private property in the areas of work. Approved barriers and warning signs shall be provided to reroute personnel around areas of dangerous work.

E. Dust Control:
   1. Dust resulting from removals shall be controlled so as to prevent its spread to occupied portions of the building and to avoid creation of a nuisance in surrounding areas. Existing spaces occupied by Owner's personnel shall be isolated from removal operations by means of temporary dust-tight barriers. Dust seals shall be installed on doors entering spaces of human occupancy. Gaskets or other means may be used provided whatever method is used will not impede the use of these exits in any manner during an emergency.

F. Access to Site and Buildings:
   1. The premises will be occupied during part of the period of alteration and renovation work. Contractor shall not restrict access to building or site by employees, students, delivery operations, etc. Contractor **shall provide covered access to building** for protection of the public, employees and for services vehicles, as may be required. Such protection devices shall comply with all governing authorities having jurisdiction.

1.03 INCONSISTENCIES:

A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REMOVALS

A. General:

1. See Drawings for notes, schedules, details, plans, etc. and see other Sections of these specifications to establish full extent of removal work required.

3.02 RELOCATIONS

A. General:

1. See Drawings for notes, schedules, details, plans, etc, and see other sections of these specifications to establish full extent of work required.
2. For items to be removed from existing construction or building, and to be relocated under this contract see Drawings and Section 02072 if applicable.

3.04 PATCHING

A. Where removals leave holes or otherwise damaged surfaces that will be exposed in the finished work, these holes and damaged surfaces shall be patched and repaired with materials and by methods which will result in equal or better work than the work being patched, both in performance characteristics and visual affect. Where work is to be applied to existing surfaces, removals and patching shall produce surfaces that are suitable for the provision of the new work. Patching shall be performed by workmen skilled in the trade involved and shall be performed in a neat and workmanlike manner. Finished surfaces of patched area shall match the existing adjacent surfaces as closely as possible as to texture and finish.

1. See Section 01045 for additional requirements.

END OF SECTION 01031

SECTION 01039 – PROJECT COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

A. **The following are the responsibilities of the Contractor during construction**.

B. It is the responsibilities of the General Contractor to determine the best pathway for material installations based on the Schematic locations indicated by the Documents and schedule the appropriate trades to minimize the interferences and to make all systems and installations come together in the allowed space. See below for additional information.

1.03 SECTION INCLUDES:

A. Contractor's responsibility to Coordinate and Schedule Inspections
B. Coordination Responsibilities
C. Alteration Project Procedures
D. Administrative and supervisory personnel.
E. General installation provisions.

1.04 RELATED SECTIONS:

A. Section 01010 – Summary of Work
B. Section 01019 – Contract Considerations
C. Section 01120 – Project Alteration Procedures
D. Section 01200 – Project Meetings
E. Section 01300 – Submittals
F. Section 01400 – Field Engineering and Quality Control Services
G. Section 01500 – Construction Facilities and Temporary Controls
H. Section 01600 - Product Substitutions
I. Section 01700 – Contract Close-out

PART 2- PROJECT COORDINATION RESPONSIBILITY:

2.01 FIELD COORDINATION OF TESTING AND AGENCY INSPECTIONS;

A. It is the Contractor's responsibility to coordinate and schedule all testing and sampling required of the Work and Contract Documents.
B. It is the Contractor's responsibility to coordinate and schedule the appropriate State/Local Review Agency inspections as required by the Work.
C. Coordinate with the Owner/Architect whether the governing agencies is Local or State.
D. Determine construction schedule and inform the Architect and Owner of required inspections and time periods.
    1. Verify the number of inspections required and when in the construction process inspections shall be made.
    2. Coordinate with Architect for requirements of Inspection Applications per Agency requirements.
    3. **Some Agencies may require that the Architect submit Inspection Application requests.**
E. Inform the Architect and Owner of scheduled inspections at least 3 days in advance for their participation as required.

2.02 COORDINATION RESPONSIBILITIES:

A. **The work of Mechanical, Electrical, Plumbing, Fire Suppression, Security, etc. trades is indicated diagrammatically on the drawings. It is the responsibility of the General Contractor/Architectural Trades Contractor to address the installation of this equipment in a 3-dimensional space and schedule the sequence of installations to allow all parts to fit according to the concept of the Documents.**

B. **Organize, coordinate, and direct the installation of listed building elements involved in the work of Mechanical, Electrical, Plumbing, Fire Suppression, Security, etc. trades, including all required clearances. The contractor shall be responsible for the layout and coordination between elements of each of these trades and all other architectural components so that all will fit within the available interstitial spaces, chases, shafts, etc.**
   1. **Pay special attention to avoid conflicts between architectural layout of lighting, diffusers, etc. (visible, architecturally coordinated items) and other elements installed in available interstitial spaces, chases, shafts, etc.**
   2. Coordinate locations of all access panels with Architect prior to finishes being applied.
   3. Schedule activities in the sequence required to obtain the best results, and in keeping with the intent of the documents. Do not allow one trade to "force out" of proper alignment, fit or coordination based on lack of scheduling.
   4. Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.
   5. Make provisions to accommodate items scheduled for later installation.
   6. Distribute memoranda to each trade involved outlining required coordination procedures. Include required notices, reports and attendance at meetings.
      a. Prepare similar memoranda for the Owner and the Owner's separate Contractors where coordination of their Work is required.
   7. Coordinate administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:
      a. Preparation of schedules.
      b. Installation and removal of temporary facilities.
      c. Delivery and processing of submittals.
      d. Progress meetings.
      e. Project closeout activities.
   9. Verify locations with future work and Code requirements.

C. Follow routing shown for pipes, ducts, conduit, etc, as closely as practicable. Place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. **Any conflicts shall be brought to the attention of the Architect prior to installation of any element, or they become the responsibility of the contractor who must then eliminate any conflicts to the satisfaction of the Architect.**

E. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean up of work of separate sections in preparation for substantial completion and for portions of work designated for Owner's partial occupancy.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with contract documents, to minimize disruption of Owner's activities.

2.03 ALTERATION PROJECT COORDINATION AND PROCEDURES:

A. See **Section 01120 – Project Alteration Procedures** for additional requirements associated with demolition and separations of Work in the scope of the Project.

B. The Contractor is responsible for complying with the above requirements as required by the particular Scope of Work herein described.

2.04 ADMINISTRATIVE AND SUPERVISORY PERSONNEL AND RESPONSIBILITIES:

A. Staff Names: Within 15 days of Notice to Proceed, submit a list of Contractor's staff assignments, including Superintendent and personnel at the site; identify individuals, their duties and responsibilities, addresses and telephone numbers.
   1. Post copies in the Project meeting room, the field office, and at each temporary telephone.
   2. The Owner and Architect shall be informed in writing of changes to supervisory staff positions, responsibilities or management changes.
B. It is the sole responsibility of the Contractor's representative to keep all Documents, Schedules and Approvals in an orderly fashion and available at the Project Site.
C. All Documents originating at the office of the Architect shall be available to the Owner and Architect for reference as needed during the progress of the Project.

PART 3- GENERAL INSTALLATION PROVISIONS:

3.01 INSPECTION OF CONDITIONS:
A. The Installer/Contractor of each component shall inspect the substrate and conditions under which Work is performed and by continuation, accept previous conditions. Do not proceed until unsatisfactory conditions have been corrected.
B. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints to obtain the best effect. Refer questionable choices to the Architect for decision.
C. Recheck measurements and dimensions, before starting installation.
D. Install each component during weather conditions and project status that will ensure the best results. Isolate each part from incompatible material as necessary to prevent deterioration.
E. Coordinate temporary enclosures with inspections and tests, to minimize uncovering completed construction for that purpose.

3.02 MOUNTING HEIGHTS:
A. Where mounting heights of equipment are not specifically indicated, install components at standard heights for the application indicated. **Refer to Typical Barrier-Free Mounting Heights Detail in Documents, and refer any questionable decisions to the Architect. Any conditions affecting accessibility of Public areas shall default to the Michigan Building Code and referenced ANSI 117.1 requirements – which shall be strictly followed.**

3.03 LIMITING EXPOSURES:
A. Supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure. Such exposures include:
   1. Excessive static or dynamic loading.
   2. Excessive internal or external pressures.
   3. Excessive weathering.
   4. Excessively high or low temperatures or humidity.
   5. Air contamination or pollution.
   6. Water or ice.
   7. Chemicals or solvents.
   8. Heavy traffic, soiling, staining and corrosion.
   9. Rodent and insect infestation.
   10. Unusual wear or other misuse.
   11. Contact between incompatible materials.
   12. Theft or vandalism.

END OF SECTION 01039

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF REQUIREMENTS

A. "Cutting and Patching" is hereby defined to include, but is not necessarily limited to, the cutting and patching of nominally completed and/or previously existing work, in order to: accommodate the coordination of work; or the installation of other work; or to uncover other work for access or inspection; or to obtain samples for testing; or for similar purposes; and is defined to exclude integral cutting and patching during the manufacturing, fabricating, erecting and installing process for individual units of work. Drilling the work to install fasteners and similar operation are excluded from the definition of cutting and patching, but may have similar requirements.
   1. Alteration work as specified for existing work in order to accomplish revisions or to accommodate new work is specified separately, and may require cutting and patching but is not specified primarily as cutting and patching work.
   2. Excavating and associated operations of boulder removal, dewatering, shoring and bracing, removal of underground debris, penetration of rock and other barriers, backfilling, and similar work may be required as special forms of cutting and patching, but are recognized primarily as examples of related but separate categories of work not specified in this section.
   3. Restoring or removing and replacing non-complying work is specified separately from cutting and patching, but may require cutting and patching operations as specified herein.

B. Refer to other sections of these Specifications, including Divisions 15 and 16, for additional cutting and patching requirements and limitations applicable to individual parts of the Work. None the less, no other reference to 'Cutting and Patching' herein included shall exclude or modify the fact that the required Work shall be done by tradesmen skilled in dealing with the particular material/installation requiring the Work.

1.03 INCONSISTENCIES:

A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

1.04 QUALITY ASSURANCE

A. The Contractor is responsible to maintain all systems/structures required for the continuation, reuse or future use of the system/structure, as inferred by the Documents. Failure to coordinate these elements during 'cutting and patching' will not relieve the contractor from the responsibility and cost of repairing to acceptable use.

B. Requirements for Structural Work:
   1. Do not cut and patch structural work in a manner resulting in a reduction of load carrying capacity or load/deflection ratio.
   2. Prior to cutting and patching the following categories of work, obtain Architect's/Engineer's approval to proceed.
      a. Major structural members including trusses, beams and columns.
      b. Miscellaneous structural members, including lintels, equipment supports and similar categories or work.
      c. Bearing walls.

C. Operational and Safety Limitations:

1. Do not cut and patch operational elements or safety related components in a manner other than intended (including energy performance), in decreased operational life, in increased maintenance, or in decreased safety.
2. Prior to cutting and patching the following categories of work and similar categories where directed, obtain Architect's/Engineer's approval to proceed with cutting and patching as proposed in submittal by Contractor:
   a. Primary operational systems and equipment
   b. Control, communication, conveying, and electrical wiring systems

D. Visual Requirements:
1. Do not cut and patch work exposed on the building's exterior or in the building's occupied spaces in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

1.05 SUBMITTALS:

A. Proposals for Cutting and Patching: Where prior approval of cutting and patching is required, submit proposal well in advance of time work will be performed, and request approval to proceed. Include the following information, as applicable, in the proposal:
1. Describe the nature of the work and how it is to be performed, indicating why cutting and patching is called for. Describe anticipated results of the work in terms of changes to existing work. Where applicable, include cost proposal and suggested alternatives to proposed cutting and patching procedure.
2. List products to be used and firms/tradesmen to perform the work.
3. Provide dates when work is expected to be performed.
4. List utilities that will be disturbed or otherwise be affected by the work, including those that will be relocated and those that will be out of service temporarily. Indicate how long utility service will be disrupted.
5. Where cutting and patching of structural work involves major structural members including trusses, beams and columns; miscellaneous structural members, including lintels, equipment supports and similar categories or work; bearing walls or the addition of or removal of reinforcement; submit details and engineering calculations to show how the cutting and patching is integrated with original structure to satisfy requirements.

NOTE: I modified the above section (5) to include all changes to structural members. (Previously, it just covered addition of reinforcing.) I think it might need a bit more work.

6. Architect's approval of cutting and patching work proposal does not waive the Architect's right to require subsequent complete removal and replacement of work found to be cut and patched in an unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. General: Except as otherwise indicated, or as directed by the Architect, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.
1. Obtain approval of the Architect before using materials other than original for patching, unless indicated otherwise.

PART 3 - EXECUTION

3.01 INSPECTION:

A. Before cutting, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.
B. Pre-Cutting and Patching Coordination Meeting: Before the start of cutting work, meet at the work site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

3.02 PREPARATION:

A. Temporary Support:
   1. Provide adequate temporary support for work to be cut to prevent any form of structural failure. Do not endanger other work. It is the contractor's responsibility to have a qualified Engineer review/approve all shoring required to maintain the existing construction.
B. Protection:
   1. Provide adequate protection of other work and existing construction during cutting and patching to prevent damage. Provide protection of the work from adverse weather exposure.
   2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
   3. Take all precautions to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.02 PERFORMANCE:

A. General: Employ skilled trades people to perform cutting and patching. Except as otherwise indicted or approved by Architect/Engineer, proceed with cutting and patching at earliest feasible time in each instance, and complete work without delay.
B. Cutting:
   1. Cut work/existing construction by methods least likely to damage work/existing construction to be retained and work/existing construction adjoining. Review proposed procedure with original installer where possible, and comply with their recommendations.
   2. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Cut holes and slots to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Coordinate with other Sections of these Specifications for specialized cutting relative to particular material and installations.
   3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or a diamond core drill, unless required to tooth in other Sections of the Documents.
   4. Comply with requirements of applicable sections of Division 2 where cutting and patching requires excavating and backfilling.
   5. Before cutting, by-pass utility services such as pipe or conduit where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
C. Patching:
   1. Patch with seams that are durable and as invisible as possible. Comply with specified tolerances for the Work.
   2. Where feasible, inspect and test patched areas to demonstrate integrity of installation.
   3. Restore exposed finishes of patched areas; extend, where necessary, finish restoration to retained adjoining work/existing construction in a manner that will eliminate evidence of patching and refinishing.

a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or re-hang existing ceilings to remain as necessary to provide an even plane surface of uniform appearance.

D. Cleaning:

1. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit and similar features before painting or finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01120 – PROJECT ALTERATION PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Making all material, installations, alterations, relocations and temporary installations come together with existing construction.
B. Removing or altering existing construction as indicated or required to complete the Work intended on the Documents.
C. Providing “seamless matching” of existing construction with new installations.
D. Providing temporary controls or barriers to protect personnel and property during construction.
E. Coordinate with **Section 01045 – Cutting and Patching** for additional information and more specifics of patching materials and Work.

1.02 SECTION INCLUDES:

A. Products and installation for patching and extending Work.
B. Transition and adjustments.
C. Repair of damaged surfaces, finishes, and cleaning.
D. Revision to existing Work as part of a Renovation.

1.03 RELATED SECTIONS:

A. Section 01010 – Summary of Work
B. Section 01039 – Project Coordination
C. Section 01045 – Cutting and Patching
D. Section 01500 - Construction Facilities and Temporary Controls
E. Sections 02070 or 02072 – Building Demolition or Alterations.

1.04 DEFINITIONS OF REQUIREMENTS:

A. The following are definitions and examples of terms used herein and in the Construction Documents to describe construction procedures noted on the Documents.
B. Removals:
   1. Removals shall be as indicated and as specified herein and in other sections of these Specifications and shall be performed in a neat and workmanlike manner to limits indicated or specified, or to minimum extent necessary or required for proper removal of existing material and installation of new work. Existing surfaces remaining after demolition, to which new work is to be applied, shall be left in a condition suitable for application of new work.
   2. Removals shall be performed without damage to adjacent retained work; however, where such work is damaged, Contractor shall patch, repair or otherwise restore same to its original or better condition in terms of performance characteristics and visual effect. In all cases the repair shall blend with the requirements of the new construction.
   3. All existing materials, fixtures, and equipment which have been removed or disconnected, but which are not indicated or specified for reuse in new work or called for to be turned over to Owner shall become property of Contractor and shall be removed from site by Contractor at his expense and legally disposed of. On-site storage or sale of salvaged items not designated for Owner reuse will not be permitted.
C. Demolition:
   1. Demolition shall be the partial or complete elimination of existing construction.
   2. Whereas the Documents may show the limits of demolition, the contractor shall be responsible to determine the exact extent to complete the intent of the Documents and complete all Work required.
D. Salvage:

1. To be removed from present location with the intent of re-installation of the material/assembly in the Project at another location.
2. The Contractor shall take care in the removal and shall store/preserve the material/assembly in it present state until re-installation.
3. Any material that is scheduled to be salvaged and will not allow reuse shall be immediately brought to the attention of the Architect for direction.

E. Salvage/Turn over to Owner:
1. The Contractor shall take care in the removal and shall store/preserve the material/assembly in it present state until it is claimed by the Owner.
2. Coordinate with Owner for location of storage or if material should be immediately turned over to the Owner.

F. Debris:
1. Debris is the remains of a demolition, relocation or temporary installation procedure.
2. Debris shall be placed in approved containers to prevent the spread and accumulation of dust and dirt. Debris shall be removed from the area of work as often as necessary, but not less than at least once at end of each work day. All such debris shall be removed from site by Contractor and legally disposed of.
3. Construction areas, interior and exterior, must be kept in a neat and orderly fashion. Trash, debris and all unusable items must be removed from the site daily. Removal must be supervised.

G. Protection:
1. Contractor shall take all necessary precautions to adequately protect personnel, and public and private property in the areas of work. Approved barriers and warning signs shall be provided to reroute personnel around areas of dangerous work.
2. Temporary partitions (noted below) may be required of proper protection methods.
3. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

H. Dust Control:
1. Dust resulting from removals shall be controlled so as to prevent its spread to occupied portions of the building and to avoid creation of a nuisance in surrounding areas.
2. Existing spaces occupied by Owner's personnel shall be isolated from removal operations by means of temporary dust-tight barriers. Dust seals shall be installed on doors entering spaces of human occupancy. Gaskets or other means may be used provided whatever method is used will not impede the use of these exits in any manner during an emergency.

I. Maintaining access to Site and Buildings:
1. The premises may be occupied during part of the period of alteration and renovation work. Contractor shall not restrict access to building or site
2. Access may be restricted as needed, but all barriers shall be coordinated with the Owner for required occupancies and shall not restrict the emergency egress pathways required for occupancy.

PART 2 -PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

A. New Materials: As typically specified in product sections; match existing Products and Work by patching and extending work in a uniform way.
1. Particular Specifications Sections may be included only for reference for material patching requirements, and should be used as needed.

B. Type and Quality of Existing Products: Determine by inspecting and testing Products where necessary, referring to existing Work as a standard.

PART 3 -EXECUTION:

3.01 EXAMINATION:

A. Coordinate with the existing construction and material to establish schedule and/or requirements of new installations.
B. Verify that demolition/renovation is complete and areas are ready for installation of new Work if demolition is carried out by separate contractor.
C. Beginning of alteration/restoration Work means acceptance of existing conditions.
D. General:
   1. See Drawings for notes, schedules, details, plans, etc. and see other Sections of these specifications to establish full extent of removal work required.
   2. It is the Contractor's responsibility to coordinate the exact extent of modification with the intent of the Documents.

3.02 PREPARATION:

A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified or required for finished Work.
C. Remove debris and abandoned items from area and from concealed spaces.
D. Prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.
E. Close openings in exterior surfaces to protect existing work [and salvage items] from weather and extremes of temperature and humidity. Insulate duct work and piping to prevent condensation in exposed areas.

3.03 REMOVALS:

A. General – removing Work or materials from present construction:
   1. See Drawings for notes, schedules, details, plans, etc. and see other Sections of these specifications to establish full extent of removal work required.
B. Masonry Walls and Portions of Masonry Walls for New Openings:
   1. See Section 3.01.E – above – for requirements of masonry work.

3.04 RELOCATIONS:

A. General – removing Work or materials from present construction and reinstalling in future Work or other locations:
   1. See Drawings for notes, schedules, details, plans, etc, and see other sections of these specifications to establish full extent of work required.
   2. For items to be removed from existing construction or building, and to be relocated under this contract see Drawings and Sections 02070 or 02072 - if applicable.

3.05 INSTALLATION:

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate continued Owner occupancy.
B. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition in accordance with Section 01045 – Cutting and Patching.
C. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes in accordance with Section 01045 – Cutting and Patching.
D. Project work areas: Complete including operational mechanical and electrical work and related services.
E. In addition to specified replacement of equipment and fixtures, restore existing plumbing, heating, ventilation, air conditioning, electrical, and related systems to full operational condition.

F. Re-cover and refinish Work that exposes mechanical and electrical work exposed accidentally during the work.
G. Install Products as specified in individual sections.
H. **See Section 01045 – Cutting and Patching for additional requirements.**

3.06 TRANSITIONS:
A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
B. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line and at a natural line of division, and make recommendation to Architect/Engineer.

3.07 ADJUSTMENTS TO EXISTING CONSTRUCTION:
A. Where removal of partitions, bulkheads, walls and or other material results in adjacent spaces becoming one: rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
B. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect/Engineer review.
C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
D. Fit work at penetrations of surfaces as specified in Section 01045.

3.08 REPAIR OF DAMAGED SURFACES:
A. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections due to the installation or modifications of the Construction Manager.
B. Repair substrate prior to patching finish.
C. Where removals leave holes or otherwise damaged surfaces that will be exposed in the finished work, these holes and damaged surfaces shall be patched and repaired with materials and by methods which will result in equal or better work than the work being patched, both in performance characteristics and visual affect. Where work is to be applied to existing surfaces, removals and patching shall produce surfaces that are suitable for the provision of the new work. Patching shall be performed by workmen skilled in the trade involved and shall be performed in a neat and workmanlike manner. Finished surfaces of patched area shall match the existing adjacent surfaces as closely as possible as to texture and finish.
   1. **See Section 01045 – Cutting and Patching for additional requirements.**

3.09 FINISHES:
A. Finish surfaces as specified in individual Product sections.
B. Specification sections may be included for reference only providing information for finishing of existing materials or surfaces.
C. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest natural intersection, transition to different material or terminus.

3.10 PATCHING
A. Where removals leave holes or otherwise damaged surfaces that will be exposed in the finished work, these holes and damaged surfaces shall be patched and repaired with materials and by methods which will result in equal or better work than the work being patched, both in performance characteristics and visual affect. Where work is to be applied to existing surfaces, removals and patching shall produce surfaces that are suitable for the provision of the new work.
B. Patching shall be performed by workmen skilled in the trade involved and shall be performed in a neat and workmanlike manner.
C. Finished surfaces of patched areas shall match the existing adjacent surfaces as closely as possible as to texture and finish.

D. **Section 01045 – Cutting and Patching for additional requirements.**

3.11 MAINTAINING ACCESS TO SITE AND BUILDINGS:

A. The premises may be occupied during part of the period of alteration and renovation work. Contractor shall not restrict access to building or site by employees, students, delivery operations, etc.

B. Contractor shall provide covered access to building for protection of the public, employees and for services vehicles, as may be required. Such protection devices shall comply with all governing authorities having jurisdiction.

C. Access may be restricted as needed, but all barriers shall be coordinated with the Owner for required occupancies and shall not restrict the emergency egress pathways required for occupancy.

END OF SECTION 01120

SECTION 01200 - PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 SECTION INCLUDES:
- A. Preconstruction conference
- B. Site mobilization conference
- C. Progress meetings
- D. Special installation Meetings
- E. Final Inspection by State or Local governing Agencies

1.03 RELATED SECTIONS:
- A. Section 01019 – Contract Considerations
- B. Section 01039 – Project Coordination
- C. Section 01400 – Field Engineering and Quality Control Services
- D. Section 01700 - Contract Closeout

1.04 CONTRACTOR RESPONSIBILITIES:
- A. It is the responsibility of the Contractor to:
  1. Establish an appointment for all meetings during the Construction period.
  2. Coordinate with the required participants for their availability
  3. Provide a location or venue for each meeting.
  4. Provide an agenda and distribute same prior to meeting to all participants.
  5. Take notes and publish Meeting Notes to all present.

1.05 PRE-CONSTRUCTION CONFERENCE:
- A. Owner/Architect will schedule a conference after Notice of Award and prior to start of construction activities.
- B. Attendance Required: Owner, Architect/Engineer and their consultants, Contractor's Superintendent, subcontractor's superintendent, and, optionally - any other suppliers, manufacturers, and other concerned parties shall be represented by persons authorized to conclude matters relating to the Work.
- C. Typical Agenda:
  1. Execution of Owner-Contractor Agreement.
  2. Submission of executed bonds and insurance certificates.
  3. Distribution of Contract Documents.
  4. Submission of list of subcontractors. Review list of products, Schedule of Values, and progress schedule.
  5. Designation of personnel representing the parties in contract and the Architect.
  6. Procedures and processing of field decisions, submittals, substitutions, applications, Applications for Payments, proposal requests, Change Orders and contract closeout procedures.
  7. Scheduling and work sequence.
  8. Submission of submittal schedule.
- D. The Contractor shall prepare resolutions to a number of Agenda items noted above for discussion during the Pre-Construction Meeting.

1.06 SITE MOBILIZATION CONFERENCE:

A. Owner will schedule a conference at the project site prior to contractor occupancy or include as part of the Pre-Construction Meeting.
B. Attendance required: Owner, Architect/Engineer, Contractor, Contractor's superintendent, and Electrical and Mechanical Contractors.
C. Typical Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements and continued occupancy.
   3. Construction facilities and controls provided by Contractor.
   4. Temporary utilities provided by owner.
   5. Survey and building addition layout.
   6. Security and housekeeping procedures.
   7. Schedules
   8. Procedures for testing.
   9. Procedures for maintaining record documents.
   10. Requirements for start-up of equipment.
   11. Inspection and acceptance of equipment put into service during construction period.
D. The Contractor shall prepare resolutions to a number of Agenda items noted above for discussion during the Pre-Construction Meeting.

1.07 PROGRESS MEETINGS:

A. Contractor will schedule and administer meetings throughout progress of work at minimum of once-per-month intervals.
   1. Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes and distribute copies within three (3) days to Architect, Owner, participants and those affected by decisions made.
B. Attendance required: Job superintendent, major subcontractors and suppliers, Owner and Architect as appropriate to agenda topics for each meeting.
C. Typical Agenda: Review minutes of the previous Progress Meeting. Review significant items that could affect progress. Include topics appropriate to the current status of the Project including, but not limited to:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Review documentation for future payment requests.
   14. Other business relating to work.
D. Construction Schedule: Review progress since last meeting. Determine where each activity is in relation to the Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   1. Review the present and future needs of each entity present, including such items as:
      a. Time.
      b. Sequences.
      c. Deliveries.
      d. Shop Drawing Logs

e. Off-site fabrication problems.
f. Site utilization.
g. Temporary facilities and services.
h. Quality and work standards.
i. Change Orders.

E. No later than three (3) days after each Progress Meeting, the Contractor will distribute copies of minutes of the Meeting to each party present and to parties who should have been present.

1.08 SPECIAL INSTALLATION MEETINGS:

A. Pre-installation meeting: Conduct a meeting before each activity that requires special coordination with other construction. The installer and representative of manufacturers and fabricators involved in the installation, and coordination or integration with other materials and installations that have preceded or will follow shall attend. Advise the Architect/Engineer of scheduled meeting dates four days in advance.
   1. Review progress of other activities and preparations for the activities under consideration at each conference, including time schedules, manufacturer's recommendations, weather limitations, substrate acceptability, compatibility problems and inspection and testing requirements.
   2. Record proceedings of each meeting, along with the approved schedule. Promptly distribute the meeting record to everyone concerned, including the Owner and Architect/Engineer.
   3. Do not proceed if the meeting cannot be successfully concluded. Resolve impediments and reconvene the meeting at the earliest feasible date.
B. Inspection of Conditions: The Installer of each component shall inspect the substrate and conditions under which Work is performed. The Installer shall report all unsatisfactory conditions in writing to the Contractor. Do not proceed with the Work until unsatisfactory conditions have been corrected.
C. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that they are more stringent than requirements in the Contract Documents.
D. Inspection of Material: Inspect material immediately upon delivery and again prior to installation. Reject damaged and defective items.
E. Provide attachment and connection devices and methods necessary for securing each construction element. Secure each construction element true to line and level, and within recognized industry tolerances. Allow for expansion and building movement.
F. Visual Effect: Provide uniform joint widths in exposed Work. Arrange joints to obtain the best visual effect. Refer questionable choices to the Architect/Engineer for final decision.
G. Recheck measurements and dimensions of the Work before starting installation.
H. Install each component during weather conditions and project status that will ensure the best possible results in coordination with the entire Work. Isolate incompatible work and materials as necessary to prevent deterioration.
I. Coordinate temporary enclosures with inspections and tests, to minimize uncovering completed construction for that purpose.
J. Mounting Heights: Where mounting heights are not indicated, install components at industry recognized standard heights for the application indicated. Refer questionable mounting height choices to Architect/Engineer for final decision.

END OF SECTION 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Construction progress schedules.
B. Product Submittal Procedures and Schedules
C. Shop Drawings.
D. Dimensions
E. Proposed Products list
F. Samples
G. Manufacturers' instructions
H. Manufacturers' certificates

1.02 RELATED SECTIONS:

A. Section 01019 - Contract Considerations: Schedule of Values.
B. Section 01039 - Project Coordination
C. Section 01400 - Quality Control: Manufacturers' field services and reports
D. Section 01600 - Material and Equipment: For Product substitutions.
E. Section 01700 - Contract Closeout: Contract warranty and manufacturer's certificates and closeout submittals.

1.03 CONSTRUCTION PROGRESS SCHEDULES:

A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement for Architect review.
B. Revise and resubmit as required.
C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
D. Submit a horizontal bar chart with a separate line for each major section of work or operation, identifying first workday of each week.
E. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
F. Indicate estimated percentage of completion for each item of work at each submission.
G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under allowances.
H. Indicate key dates for coordination of vacation of contract limits, removal of existing building components designated as the responsibility of the Owner, and other milestones affecting construction progress which require coordination with the Owner's operation.

1.04 PRODUCT/SHOP DRAWING SUBMITTAL PROCEDURES:

A. Prepare Submittal and Shop Drawing Schedule and submit to the Architect/Engineer for review within 15 days after date of Owner-Contractor Agreement. Schedule shall include a tabular breakdown, by specification Section, of all required submittals as listed in each Section, the anticipated submittal date of each item, and when return is required in order to meet construction schedules.
B. **Allow a minimum of ten (10) working days for Architect/Engineer review of submittals.**
C. Transmit each submittal with AIA Form G810, or Contractor's standard transmittal form as acceptable to Architect.
    1. Transmit the Submittal/Product sample directly to the responsible party. Example - If the submittals are Mechanical, send directly to the Mechanical Engineer with a copy transmitted to the Architect for their record/file. This procedure shall by similar for all other consulting parties. Subsequently, the Engineer shall transmit all reviewed Submittals to the Architect for their review/comment and final transmittal to the

Contractor. This shall be the normal procedure for all Product Submittals. Coordinate with the Architect for products that do not have a clearly defined responsibility.

2. Submit two (2) copies of each shop drawing submitted, plus one original that will be used as a master to be copied and distributed by the Contractor to all pertinent parties. The Contractor shall be responsible for duplications so that the Architect/Engineer/Owner have appropriate information.
3. **Electronic files are preferred for Shop Drawing Review Submittals**
   a. Submit an electronic file in the form of a .PDF.
   b. If the particular Shop Drawing is the responsibility of an Architect's consultant, transmit to consultant and simultaneously to the Architect for record.
   c. Transmit an electronic copy of a transmittal with all information similar to AIA G810.
   d. The contractor shall have "stamped and noted" all of his responsibilities on the electronic version of the document.
   e. The Architect will make all notes, comments and stamps electronically in the .PDF file.
   f. The Contractor shall receive and subsequently transmit to appropriate subcontractors the Shop Drawings in paper or electronic form as required.

D. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
   1. Revise and resubmit submittals as required, identify all changes made since previous submittal. Renumber the subsequent submittals accordingly.
E. Identify project, Contractor, subcontractor or supplier; pertinent drawing sheet and detail number(s), and specification Section number, as appropriate.
F. **Apply Contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the work and Contract Documents. Submittals not Approved and stamped by the Contractor prior to delivery to the Architect shall be returned unreviewed**.
G. Schedule submittals to expedite the project, and deliver to the appropriate business address. As agreed to by the Architect/Contractor – send Review copies directly to the Engineer and a transmittal/record copy to the Architect. Coordinate submission of related items.
H. Provide space for Contractor and Architect/Engineer review stamps.
I. Identify variations from contract documents and product or system limitations that may be detrimental to successful performance of the completed work.
J. Distribute copies of reviewed submittals to concerned subcontractors/Owner. Instruct parties to promptly report any inability to comply with provisions.

1.05 SHOP DRAWINGS RESPONSIBILITIES:

A. The Architect is limited in responsibility of Shop Drawing Review as stated in AIA Document A201-2007 – General Conditions of the Contract for Construction, as herein stated, and referenced elsewhere in these Specifications.
B. **The Architect will not accept Shop Drawings unless properly reviewed by the sub-contractor/supplier and the General Contractor/Construction Manager. The Architect is responsible for design concept as expressed in the Contract Documents. The Contractors are responsible for installation means and integration into other work of the Project. The Architect will not review submitted Shop Drawings unless the Contractor has Approved and stamped each submittal, and noted their responsibility to 'Field Verify' dimensions where applicable, prior to submission to the Architect.**
C. Refer to Section 01600 – Product Substitutions for proper procedures regarding Substitution Requests.
D. Prior to and after review, reproduce and distribute in accordance with Article on Product Submittal Procedures noted above and for Record Documents described in Section 01700 - Contract Closeout.

1.06 DIMENSIONS:

A. The Contractor shall be solely responsible to field measure project conditions prior to submitting Shop Drawings and shall be solely responsible to ensure that dimensions noted on Shop Drawings will be properly accommodated by related construction that takes place after Shop Drawings have been approved.
B. Any dimensions noted by the Architect on any Shop Drawings shall be determined to be a requirement of the particular detail or installation and shall be coordinated with Field Conditions by the Contractor to be sure that all dimensions and material fit. Any required changes shall be noted to the Architect immediately.
C. The Architect shall not be requested to fill in dimensions that should be associated with Field Conditions. This is the responsibility of the Contractor.

1.07 PROPOSED PRODUCTS LIST:
A. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.08 SAMPLES:
A. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
B. Submit samples of finish from the full range of manufacturers' standard colors (unless noted otherwise in individual section), textures, and patterns for Architect's selection.
C. Include identification on each sample, with full project information.
D. Submit the number or samples specified in individual specification sections; one of which will be retained by Architect/Engineer.
E. Reviewed samples that may be used in the work are indicated in individual specification sections.

1.09 MANUFACTURER'S INSTRUCTIONS:
A. When specified in individual specification sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for product data.
B. The Contractor shall identify conflicts between manufacturer's instructions and contract documents.

1.10 MANUFACTURER'S CERTIFICATES:
A. When specified in individual specification sections, submit manufacturer's certificate to Architect for review, in quantities specified for product data.
B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

END OF SECTION 01300

SECTION 01400 – FIELD ENGINEERING AND QUALITY CONTROL SERVICES

PART 1 – GENERAL

1.01 SECTIONS INCLUDE:

A. Requirements for Field Engineering
B. Quality Assurance and Control of Installation
C. Field Samples
D. Contractor's Responsibilities for Inspections
E. Inspection and Testing Laboratory Services
F. Manufacturer's Field Services and Reports

1.02 RELATED SECTIONS:

A. Section 01090 - Reference Standards.
B. Section 01039 – Project Coordination
C. Section 01300 - Submittals: Submission of Manufacturer's instructions and certificates
D. Section 01610 - Material and Equipment: Requirements for material and product quality

PART 2 – FIELD ENGINEERING AND RESPONSIBILITIES

2.01 SUMMARY - REQUIREMENTS FOR FIELD ENGINEERING:

A. This Section specifies requirements for field engineering.
B. Certificates: Submit/coordinate a certificate signed by the Land Surveyor certifying that the location and elevation of improvements comply with Contract Documents.
C. Surveyor: Engage a Land Surveyor registered in the State where the Project is located, to perform land surveying required.
D. Examination: The Owner will assist in identifying existing control points and property line corner stakes.
E. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Protect existing benchmarks and control points. Preserve permanent reference points during construction.
    1. Do not change or relocate benchmarks or control points without prior written approval. Report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
    2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.
F. **Establish and maintain a minimum of two permanent benchmarks on the site**, referenced to data established by survey control points.
    1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
G. Existing utilities and equipment: The existence and location of underground utilities and construction indicated as existing are not guaranteed. Before beginning sitework, verify the existence and location of underground utilities and other construction.
    1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.
H. Performance: Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and where needed to properly locate each element. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
    1. Advise entities engaged in construction activities, of marked lines and levels provided for their use.
    2. As construction proceeds, check every major element for line, level and plumb.

I. Surveyor's Log: Maintain a surveyor's log of control and other surveys. Make this log available for reference.
   1. Record deviations from required lines and levels. Advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On record Drawings, record deviations that are accepted and not corrected.
   2. On completion of foundation walls, major site improvements, and other construction requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and site Work.

J. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

K. Building Lines and Levels: Locate and lay out batter boards/control points for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

L. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.

M. Final Property Survey: Before Substantial Completion, prepare a final property survey showing significant features for the Project. Include a certification, signed by the Surveyor, to the effect that metes, bounds, lines and levels of the Project are accurately positioned as shown on the survey.
   1. Recording: At Substantial Completion, have the final survey recorded by or with local authorities as the official "property survey".
   2. Project Record Documents: Submit a record of Work performed and record survey data required under provisions of Sections "Submittals" and "Project Closeout".

2.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION:

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturer's instructions, including each step in sequence.

C. Should manufacturer's instructions conflict with contract documents, request clarification from Architect/Engineer before proceeding. Refer to ‘Request for Information’ forms herein attached.

D. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality and by trades normally associated with the work. Example: All cutting and patching will be performed by tradesmen skilled in the application/material of the individual task.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

2.03 FIELD SAMPLES:

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the work.

C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect.

PART 3 – INSPECTION REQUIREMENTS

3.01 CONTRACTOR RESPONSIBILITIES FOR INSPECTIONS:

A. **Provide inspections and tests specified or required by governing authorities, except where they are specifically noted to be the Owner's responsibility**, or are provided by

another entity. Services shall include those specified to be performed by an independent agency - not by the Contractor.
1. Employ an independent agency to perform Quality Control Services.
2. **Costs for all inspections and/or Quality Control Services are to be included in the Bid/Contract**.

B. Where the Owner has engaged an agency for testing and inspecting part of the Work, and the Contractor is also required to engage an entity for the same element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
1. Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.
a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
2. Associated Services: The Contractor shall cooperate with agencies performing inspections or tests and provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include but are not limited to:
a. Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
b. Take representative samples of materials that require testing or assist the agency in taking samples.
c. Provide facilities for storage and curing of samples, and deliver samples to testing laboratories.
d. Provide a preliminary design mix proposed for use for material mixes that require control by the testing agency.
e. Provide security and protection of samples and test equipment at the Project site.

C. Coordination: The Contractor and each agency engaged to perform inspections and tests shall coordinate the sequence of activities to accommodate services with a minimum of delay. The Contractor and each agency shall coordinate activities to avoid removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling inspections, tests, taking samples and similar activities.

3.02 INSPECTION AND TESTING LABORATORY SERVICES:

A. Contractor shall employ services of an independent firm approved by the Architect to perform inspection and testing where authorized by the Owner. Contractor shall pay for services, unless noted otherwise in these Specifications.

B. The independent firm will perform inspections, tests, and other services specified within individual specification sections and as recommended by the Architect/Engineer and authorized by the Owner.

C. Reports will be submitted by the independent firm to the Architect, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with contract documents. Report Data: Written reports of each inspection or test shall include, but not be limited to:
1. Date of issue.
2. Project title and number.
3. Name, address and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the inspection or test.
6. Designation of the Work and test method.
7. Identification of product and Specification Section.
8. Complete inspection or test data.
9. Test results and an interpretation of test results.

10. Ambient conditions at the time of sample taking and testing.
11. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
   1. Notify independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for contractor's use.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the contract sum.

F. Qualification for Service Agencies: Engage inspection and testing agencies which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and specialize in the types of inspections and tests to be performed.
   1. Each inspection and testing agency engaged shall be authorized to operate in the State in which the Project is located.

3.03 MANUFACTURERS' FIELD SERVICES AND REPORTS:

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and as applicable and to initiate instructions when necessary.

B. Individuals to report observations and site decisions or instruction given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

C. Submit report within 30 days of observation to Architect for review.

END OF SECTION 01400

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES:
- A. Temporary Utilities: Electricity, lighting, water and sanitary facilities
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the work and water control
- C. Construction Facilities: Site access, parking, progress cleaning, project signage, and temporary buildings

1.02 RELATED SECTIONS:
- A. Section 01010 – Summary of Work
- B. Section 01019 – Contract Considerations
- C. Section 01039 – Project Coordination
- D. Section 01200 – Project Meetings

1.03 TEMPORARY ELECTRICITY:
- A. Connect to existing power service. Power consumption shall not disrupt Owner's need for continuous service.
- B. Provide temporary electric feeder from existing building electrical service at location as directed. Power consumption shall not disrupt Owner's need for continuous service.
- C. Owner will pay cost of energy used. Exercise measures to conserve energy.
- D. Permanent convenience receptacles may be utilized during construction.
- E. Provide adequate distribution equipment, wiring and outlets to provide single-phase branch circuits for power and lighting
- F. If available electrical service is not adequate for Contractor's equipment, the Contractor shall provide temporary power sources and devices on site for his equipment at no cost to the Owner.

1.04 TELEPHONE SERVICE:
- A. Provide, maintain and pay for telephone service to field office at time of project mobilization.

1.05 TEMPORARY WATER SERVICE:
- A. Connect to existing water source for construction operations.
- B. Owner will pay cost of water used. Exercise measures to conserve water.
- C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.06 TEMPORARY SANITARY FACILITIES:
- A. Existing facilities may be used.

PART 2 - CONTROLS

2.01 BARRIERS:
- A. Provide a barrier around the contract limits to prevent unauthorized entry to construction areas during non-work hours and to allow for continued use of the adjacent site and building areas by the owner and the public, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide protection for plant life designated to remain. Replace damaged plant life.

2.02 WATER CONTROL:

A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
C. Coordinate with requirements of State and County jurisdictions for barriers and controls.

2.03 PROTECTION OF INSTALLED WORK:
A. Protect installed work and provide special protection where specified in individual specification Sections.
B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
D. Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
F. Prohibit traffic from landscaped areas.

2.04 PROGRESS CLEANING:
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Remove waste materials, debris, and rubbish from site periodically and dispose off-site.

2.05 SECURITY:
A. Provide security and facilities to protect work, and existing facilities and Owner's operations from unauthorized entry, vandalism, or theft.
B. Coordinate with Owner's security program, if applicable.

PART 3 - FACILITIES

3.01 ACCESS ROADS AND PARKING:
A. Designated existing on-site roads shall be used for construction traffic.

END OF SECTION 01500

SECTION 01600 - PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

A. Requests proposed by the Contractor **after award of the Contract** for deviation from specified products, materials, equipment, and/or methods of construction required by Contract Documents are considered "substitution" requests.
B. A Contractor's "Substitution Request Form" (attached herein) may be considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect. Otherwise, requests will be returned without action except to record noncompliance with these requirements.
   1. Extensive revisions to Contract Documents are not required.
   2. Proposed changes are in keeping with the general intent of Contract Documents.
   3. The request is timely, fully documented and properly submitted.
   4. The request is directly related to a "similar or equal" clause or similar language in the Contract Documents.
   5. The specified product or method of construction cannot be provided within the Contract Schedule as previously established. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
   6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
   7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, and similar considerations.
   8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
   9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
   10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution shall provide the required warranty.
C. Substitution requests are permitted under the following terms:
      1. All substitution requests must be made directly by the General Contractor to the Architect. No substitution requests will be accepted from sub-contractors.
      2. **All substitution requests must be accompanied by a signed, fully completed "Substitution Request Form" found at the end of this Section.**
         a. Submit 3 copies of the "Substitution Request Form" completely filled out.
         b. In addition, provide the following information, as appropriate:
            i. Samples, where applicable or requested.
            ii. A statement indicating the substitution's effect on the Construction Schedule compared to the Schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
            iii. Contractor's waiver of rights to additional payment or time that may be necessary because of the substitution's failure to perform adequately.
      3. The General Contractor/Construction Manager has reviewed the Request and feels it is necessary or preferable for the completion of the Project, and the GC/CM confirms that the schedule will not be negatively impacted.
      4. Requests for substitution will be considered if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.
      5. **The Architect shall be compensated for the time involved in evaluating the Substitution Request and for any and all revisions to the Documents required by the aforementioned change, except where the substitution is required due to the**

Architect's responsibilities. The rate of compensation shall be: $100/hr per staff time involved.

D. Architect's Actions:
   1. Within one week of receipt of the Substitution Request Form, the Architect may request additional information necessary for evaluation.
   2. Within 2 weeks of receipt of the request, or one week of receipt of additional information, which ever is later, the Architect will notify the Contractor of acceptance or rejection.
   3. **If a decision on use of a substitute cannot be made within the time allocated, the product specified shall be incorporated into the Work.**
   4. Acceptance of the Substitution Request Form will be in the form of a Change Order issued by the GC/CM after incorporation into the Work.

E. The following are not considered substitutions:
   1. When an item or material is generic and the Contractor's proposed item is different only in its name, size, color, etc., and not specifically required to comply with an 'or equal' standard.
   2. Substitutions requested made during the bidding period or included with the Bid Form on the Bid Due Date, and accepted prior to award of Contract. See Section 00100 – Instructions to Bidders for additional information.
   3. Revisions to Contract Documents requested by the Owner or Architect.
   4. Specified options of products and construction methods included in Contract Documents.
   5. Compliance with governing regulations and orders issued by governing authorities.

F. The Contractor's submittal and, if applicable, the Architect's acceptance of Shop Drawings, Product Data, and/or or Samples which do not comply with the Specifications, does not constitute an acceptable or valid request for substitution, nor does it transfer responsibility for meeting all provisions set forth in these Contract Documents from the Contractor to the Architect.

G. The Architect/Owner maintains the right to reject any and all Substitution Requests at their own discretion.

END OF SECTION 01600

"Substitution Request Form" follows on pages 3 and 4.

SUBSTITUTION REQUEST FORM

The General Contractor:_____ shall initially review this Substitution Request and, if believing it to be relevant, forward it for review by the Architect.

Project:_____

The Sub-Contractor - _____ hereby submits for your consideration the following substitution product instead of the specified product for the above noted Project:

Spec. Section	Section Paragraph	Original Product

Proposed Substitution: (explain using attachments as needed):_____

Attach complete technical data including laboratory tests, if applicable. Include complete information for modification(s) to Documents and/or Specifications required for proper installation as made necessary by proposed Substitution.

Provide the following information, using additional sheets if necessary:

A. **FOR POST-BID SUBSTITUTION REQUESTS ONLY:** If the substitution request is accepted, will the Contractor proposing the substitution pay for any and all changes to the building design, including engineering, detailing, and plan review / permit costs, etc. created by the acceptance of the proposed substitution?

   signify: Yes ( ) or No ( ) – comments: _____

B. **FOR POST-BID SUBSTITUTION REQUESTS ONLY:** Does the GC and Contractor understand that, should the proposed substitution item(s) fail to meet or exceed all the requirements of the specified item(s), the substitution may be rejected at the Architect's discretion and, if so, the GC/CM and/or Contractor will be required to reimburse the Architect directly, on a $100.00/hr. basis, for the time taken to review the rejected substitution?

   signify: Yes ( ) or No ( ) – comments: _____

C. Does the substitution affect dimensions or material fit shown or implied in the drawings?

   signify: Yes ( ) or No ( ) – comments: _____

D. What effect does the substitution have on other trades?

E. Are there differences between the proposed substitution and specified items?

   signify: Yes ( ) or No ( ) – comments: _____

F. Is there a material benefit to the Owner or Project if this substitution is accepted?

signify: Yes ( ) or No ( ) – comments: _____

G. Does the proposed substitution represent a cost savings to the Owner or Project?

signify: Yes ( ) or No ( ) – comments: _____

If so, what is the savings? _____

_____

H. Manufacturer's guarantees of proposed and specified items are:

Same ( ) Different ( ) (explain on attachment if necessary)

The GC states that the function, appearance, and quality of the substitution item(s) is/are equivalent or superior to the specified item and that items A through H above are correct and binding. The GC shall affirm by signature below:

Submitted By:

_____
Signature

Date_____

Firm Name_____

Address_____

Telephone_____

For use by Architect or Consultant:

☐ Accepted

☐ Accepted as noted

☐ Rejected

☐ Received too late

By:_____

Date:_____

Remarks:_____

_____

_____

_____

_____

SECTION 01610 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES:
- A. Products
- B. Transportation and handling
- C. Storage and protection
- D. Product options

1.02 RELATED SECTIONS:
- A. Section 01400 - Quality Control: Product quality monitoring
- B. Section 01600 – Product Substitutions

1.03 PRODUCTS:
- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the contract documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.04 TRANSPORTATION AND HANDLING:
- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities, are correct and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION:
- A. Store and protect products in accordance with manufacturer's instruction, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Provide mixing with foreign matter.
- F. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.06 INCONSISTENCIES:
- A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

END OF SECTION 01600

SECTION 01700 CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 SECTION INCLUDES:
- A. Final Acceptance
- B. Starting Systems
- C. Operation and Maintenance Manuals
- D. Warranties

1.03 RELATED SECTIONS:
- A. Section 01019 – Contract Considerations
- B. Section 01039 – Project Coordination
- C. Section 01200 – Project Meetings
- D. Section 01400 – Field Engineering and Quality Control Services

PART 2 – FINAL ACCEPTANCE

2.01 SECTION INCLUDES:
- A. Substantial Completion
- B. Final Inspection

2.02 SUBSTANTIAL COMPLETION
- A. Before requesting inspection for certification of Substantial Completion, the Contractor shall complete the following:
  1. In the Application for Payment that coincides with the date for which Substantial Completion is claimed, show 100% completion for the portion of the Work claimed substantially complete.
  2. Submit specific warranties and similar documents.
  3. Submit record drawings and similar record information.
  4. Complete final clean-up.
- B. When contractor considers that the work is substantially complete, he shall prepare for the Architect a list of items to be complete or corrected.
- C. Upon request by the Owner, the Architect will make an inspection to determine the status of completion.
- D. When the Architect, on basis of inspection, concurs that the work is substantially complete, he will:
  1. Prepare a Certificate of Substantial Completion of AIA Form G704, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
  2. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

2.03 PROJECT COMPLETION REQUIREMENTS:
- A. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions. Administrative actions and submittals that precede or coincide with this application include:
  1. Occupancy permits.

2. Warranties and maintenance agreements.
3. Test/adjust/balance records.
4. Maintenance instructions.
5. Meter readings.
6. Change-over information related to Owner's occupancy.
7. Final cleaning.
8. Application for reduction of retainage, and consent of surety.

B. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final payment application include:
1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Transmittal of required Project construction records to Owner.
4. Certified property survey.
5. Proof that taxes, fees and similar obligations have been paid.
6. Change of door locks to Owner's access.

2.03 FINAL INSPECTION

A. Before requesting inspection for certification of final acceptance and final payment, the Contractor shall submit the following to the Architect:
1. Guarantees and warranties as required by other sections.
2. Evidence of payment and release of liens, per all requirements stated in the General and Supplementary Conditions.
3. A final statement, accounting for changes to the Contract Sum.
4. A copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
5. Consent of surety to final payment.
6. Evidence of continuing insurance coverage complying with insurance requirements.

B. When the Contractor considers that the work is complete, he shall submit written notice to the Architect that the Work is ready for final inspection and acceptance, and also include a final Application for Payment.

C. The Architect will make an inspection to verify the status of completion with reasonable promptness.

D. When the Architect finds the Work acceptable under the Contract Documents, he will issue a Project Certificate for Payment that will approve the final payment due the Contractor.

PART 5 - WARRANTIES

5.01 SECTION INCLUDES:

A. Preparation and submittal of warranties.
B. Time and schedule of submittals.

5.02 RELATED SECTIONS:

A. General Conditions - AIA Document A201 or A201-C/M: Warranties and correction of work.
B. Section 01019 – Contract Considerations
C. Individual Specifications Sections: Warranties required for specific Products or Work.

5.03 FORM OF WARRANTY SUBMITTALS:

A. Bind in commercial quality 8-1/2 x 11 inch, three D side ring binders with durable covers.

B. Cover: Identify each binder with typed or printed title WARRANTIES with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.

D. Separate each warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

5.04 PREPARATION OF SUBMITTALS:

A. Obtain warranties executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties until time specified for submittal.

5.05 TIME OF SUBMITTALS:

A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
B. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period. Coordinate with the Construction Manager for exact time of submittal.

END OF SECTION 01700

SECTION 02070 - DEMOLITION AND ALTERATION WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. All Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions, Division 0, and Division 1 Specification sections apply to the Work of this Section.
B. Extent of Selective Demolition Work is indicated on Drawings and described herein.
C. **In all cases – modify existing construction to make acceptable for new construction.**
D. Types and requirements of Selective Demolition Work:
   1. Removing misc. site equipment, fencing, etc.
   2. In every case, items shown or noted to be “demolished”, “removed”, “relocated”, or “salvaged” shall be removed in their entirety, including all supports, fasteners, and accessories; whether or not shown or noted.
   3. Demolition requires the selective removal and subsequent offsite disposal of the following:
      a. Portions of concrete sitework indicated on drawings and as required to accommodate new construction.

1.02 DEFINITIONS

A. "Remove" is hereby defined as the extraction of the item from its position and the disposal of the item as directed in compliance with the specified classifications, and as required by law.
   1. Concrete and masonry shall be removed in small sections and dampened to keep down dust during removal.
   2. Debris resulting from removal operations shall be removed promptly, without accumulation on the site.
   3. After materials and equipment are removed, the structure to remain in place shall be evaluated and the Architect shall be notified of defects uncovered. Repair of such defects and other additional work required by the Architect will be compensated by contract adjustment in accordance with the conditions of the contract.
B. "Relocate" is hereby classified as any material or equipment removed under this alteration operation, including incidental parts, pieces or attachments, which meets the requirements of the applicable section shall be carefully removed, thoroughly cleaned, and finished as specified in the applicable section of the specifications, then installed as specified for new material.
   1. When procedure of the work prevents the immediate reinstallation of items specified or indicated as "relocate", such items shall be protected, transported and stored until such time as reinstallation is possible. When ready for the reinstallation, remove the items from storage and reinstall in new locations.
   2. In lieu of relocating an existing item, the Contractor may provide a new item, subject to the Architect's approval, and classify the item to be relocated as trash.
C. "Salvage" is hereby classified as any useful material or equipment that will not be reused as part of the project. Such material shall be dismantled to useful sizes, shapes or components and delivered to the owner on the site, set up or packaged for storage as directed by the Architect or as specified. Large equipment/materials shall be placed on wood skids for ease of handling. Removal of paint, degreasing or cleaning, except that required for normal handling, shall not be a part of this classification. Material and equipment salvaged from the operation shall remain the property of the owner.
D. "Trash" is hereby classified as all unusable or unsalvageable materials, such as used lumber, broken concrete, masonry, glass, sheet metal, pipe and steel, and shall become the property of the Contractor, be removed as the work progresses, and be legally disposed of off the site.

1.03 JOB CONDITIONS

A. Condition of Structures:
   1. Owner assumes no responsibility for actual condition of items or structures to be demolished.
   2. Conditions existing at time of commencement of contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

B. Partial Demolition and Removal:
   1. Items indicated to be removed but of salvable value shall be determined by the Owner as to salvage/reuse value.

C. Protection:
   1. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work. Create separations (fire-rated if required) between construction and any occupied areas.
   2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

D. Damages:
   1. Promptly repair damages caused to adjacent facilities by demolition not in this Scope of Work at the Contractor's expense.

E. Traffic:
   1. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Coordinate with the appropriate authorities for any required permits.
   2. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

F. Explosives:
   1. Use of explosives will not be permitted.

G. Utility Services:
   1. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
   2. Do not interrupt existing utilities serving occupied or otherwise used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

H. Environmental Controls:
   1. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
   2. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding and pollution.

1.04 INCONSISTENCIES:

A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

PART 2 - EXECUTION

2.01 INSPECTION

A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties that could be misconstrued as damage resulting from selective demolition work; file with the architect prior to starting work.

2.02 DEMOLITION

A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with plans and governing regulations.
   1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
   2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

2.03 SALVAGE MATERIALS
A. Where indicted on drawings as "salvage" - deliver to Owner. Carefully remove indicated items, clean, store and turn over to Owner at a prescribed location.
B. The Contractor shall coordinate with the Owner regarding the disposition of any salvageable items remaining in each work area prior to Contractor starting work. Items deemed salvageable by the Owner shall be turned over to the Owner. Items deemed unsalvageable by the Owner shall be legally disposed of off site by the Contractor.

2.04 DISPOSAL OF DEMOLISHED MATERIALS
A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
   1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws and ordinances concerning removal, handling and protection against exposure or environmental pollution.
   2. Burning of removed materials is not permitted on project site.

2.05 RESPONSIBILITY:
A. The Contractor shall be solely responsible for coordinating demolition with the extent of finished work to avoid the unscheduled removal of any building component.
B. Unscheduled removal of any building component shall be replaced to previous condition at the Contractor's cost.

2.06 CLEAN-UP AND REPAIR:
A. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protection and leave interior areas broom clean.
B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction of surfaces soiled or damaged by selective demolition work.
C. Remove any temporary work not part of the ongoing Project.

END OF SECTION 02070

SECTION 02110 - SITE PREPARATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 DESCRIPTION OF WORK:
- A. Scope: Prepare site as shown on the Drawings and as specified herein.
- B. Extent of work shall include but not be limited to:
  1. Existing structures and vegetation protection.
  2. Temporary erosion control measures.
  3. Clearing and grubbing of existing vegetation.
  4. Pavement removal
  5. Salvage, removal and disposal of misc. property items.
  6. Stripping and stockpiling of topsoil. (At Contractor's option.)
  7. Adjustment and protection of existing utilities.
  8. Fence removal

1.03 RELATED SECTIONS:
- A. Section 01010 - Summary of Work.
- B. Section 02200 - Earthwork.

1.04 PERMITS:
- A. Soil Erosion and Sedimentation Control Permit shall be obtained and all charges paid by the Contractor.

1.05 MDOT COMPLIANCE:
- A. Materials and Work covered under this Section shall be in accordance with MDOT unless otherwise indicated.

1.06 PROTECTION
- A. Maintain in service and protect from damage the existing utilities that are to remain.
- B. Before commencing any site preparation activity, contact all municipal service departments, service companies and other utilities affected, and arrange to have the lines that are within the work area accurately located and identified with appropriate surface markers.
- C. If any other utility lines are known to extend beyond the work area, such lines shall be located and identified as in the above paragraph.
- D. The use of explosives is prohibited. No burning will be allowed on site.
- E. Conduct site preparation operations to insure safety of all persons and to prevent damage to existing structures and utilities, trees and other vegetation to be left in place, construction in progress, and other property.

PART 2 - PRODUCTS

2.01 CONSTRUCTION/BARRIER FENCE:
- A. Fence shall be ALPI safety fence available through Construction Supply, 313-887-6767, or similar.

2.02 EROSION CONTROL MATERIALS:
- A. All materials shall conform to City of Ann Arbor Public services department Standard Specifications.

B. Silt Fence shall be Beltech 751, prefabricated silt fence or approved substitute.

2.03 TOPSOIL:

A. Definition: a friable surface soil found in varying depths. Acceptable topsoil for re-spreading shall be:
   1. Reasonably free of subsoil, clay lumps, stones, and other objects over two inches in diameter.
   2. Without weeds, roots and other objectionable material.

PART 3 - EXECUTION

3.01 EXISTING STRUCTURES & VEGETATION PROTECTION:

A. Protection shall be installed around trees and other vegetation indicated on the Drawings to remain. Installation of protection shall not damage bark or root structure of trees or root system of other vegetation.
B. Trees not indicated to be removed or transplanted with or without tree protection shall not be injured or defaced in any way. Any damage shall be replaced or repaired by a skilled tree surgeon approved by the Architect at no expense to the Owner.
   1. Storage of materials, parking vehicles or stockpiling inside the drip line of trees to remain shall not be permitted.
C. Existing utilities to remain shall be protected and maintained to prevent leakage, sedimentation settlement, or other damage. Any damage shall be repaired or replaced to former condition and as required by the utility company or municipal or state government department affected.
D. Protect bench marks and established control points.

3.02 EROSION CONTROL MEASURES:

A. Operations shall be conducted in such a manner as to reduce and contain erosion. The amount of time land is exposed to the elements by grading operations shall be the minimum.
B. Public Act 346, the Soil Erosion and Sedimentation Control Act of 1972 as amended, must be complied with. Should the local regulatory agency determine that the construction operation is in violation of the Soil Erosion Act, the Contractor shall take immediate action to remedy the situation.
C. Responsibility to render the site erosion free is the Contractor's. Approval by the Architect of any method to accomplish this does not relieve the Contractor of full responsibility.
D. The contractor shall employ on site throughout the duration of the project a state registered storm water operator.
E. Delays due to shut down from non-compliance with the Soil Erosion Act are the responsibility and at the expense of the Contractor.

3.03 PAVEMENT AND CURB REMOVAL:

A. Remove all pavement and curbs as indicated on drawings.
B. Saw cut to bottom of pavement and curb being removed.
C. Saw cut curb at existing joint.
D. Removal shall be full depth including base material.

3.04 CLEARING AND GRUBBING:

A. As specified on the plans, the Contractor shall review all tree removals with the Architect prior to any operations.
B. Completely remove all trees, shrubs and stumps from areas as noted on the drawings and as directed by the Architect. Remove without injury to trees to remain. Do any additional cutting or trimming only as necessary and as directed by the Architect in accordance with standard horticultural practice.

C. Stumps within project limits shall be completely removed. Outside of these areas, stumps may be chipped to a depth of at least two feet below final finish grade. The stump hole or other holes from which obstructions have been removed shall be backfilled to the adjacent grade in accordance with Section 02200 "Earthwork" of these Specifications.
D. Chip all chippable material and stockpile in locations on the site in agreed upon location. Material not suitable for chipping shall be disposed of legally off-site.
E. Salvaged material may be used to mulch root zones of protected plant material.

3.05 SALVAGE, REMOVAL AND DISPOSAL:
A. Completely remove and properly dispose of off-site all items indicated for removal on the Drawings and miscellaneous debris. Backfill in accordance with Section 02200 "Earthwork" of these Specifications.
B. Salvage material so indicated on the Drawings or identified by the Owner in accordance with provisions of Section 02060. Salvaged material shall be turned over to the Owner.
C. Any saw cut locations shall be approved by Architect.
D. Protect from damage all adjoining property and all City property not scheduled for construction.

3.06 STRIP AND STOCKPILE TOPSOIL:
A. Extent of stripping shall be areas to be occupied by a new surface or any area where grade is to be changed and as indicated on the plans.
B. All topsoil shall be removed down to subsoil in such a manner as to prevent intermingling with subsoil. Grass shall be removed from topsoil prior to stripping.
C. Trees to remain shall not have topsoil stripped within the drip line.
D. Ownership: the topsoil remains the property of the Owner and shall not be removed from the site.
E. Stockpile as directed by Architect; cover as required to prevent erosion and windblown dust.

3.07 ADJUSTMENT & PROTECTION OF EXISTING UTILITIES:
A. All manholes, valve boxes, gate valves, etc. (if any) shall be adjusted to conform to shape and grade of finished grade. This adjustment shall be in accordance with the regulating agency of the utility involved.
B. Protect existing utilities to remain.

3.08 INSPECTION AND TESTING:
A. Notify Architect upon completion of clearing and stripping and demolition operation; to enable inspection by the Testing Agency (if deemed necessary). Do not commence earthwork operations until receipt of notification to do so from the Consultant.

END OF SECTION 02110

SECTION 02200 - EARTH WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 DESCRIPTION OF WORK:

A. In General - **Excavate, backfill, compact and grade the site** to the elevations shown on the drawings, as specified herein and/or as necessary to meet the requirements of the construction shown in the Contract Documents.

B. Work shall include, but not be limited to:
   1. General excavation
   2. Removal of topsoil and subsoil (as required by balancing the site)
   3. Filling and backfilling for new building and structures
   4. Drainage and bedding courses for slabs-on-grade
   5. Excavating and backfilling for utility trenches
   6. Consolidation and compaction
   7. Fill for over-excavation
   8. Removal of unsuitable and excess material

C. Aggregate base course(s) under asphaltic and concrete paving – see Sections 02513-Asphalt Concrete Paving and 02514-Portland Cement Concrete Paving for additional information and specifications.

1.03 RELATED SECTIONS:

A. Section 02070 – Demolition and Alteration
B. Section 02110 - Site Preparation
C. Section 02218 – Finish Grading
D. Section 02513 – Asphalt Concrete Paving
E. Section 02514 – Portland Cement Concrete Paving
F. Section 02936 – Fine Grading and Grasses

1.04 DEFINITIONS:

A. Subgrade - the bottom of excavation or surface of fill immediately beneath the proposed site improvements, sub-base course, drainage fill or topsoil**. If the subgrade has deleterious material, or is found to be a fill material after excavation – immediately inform the owner/architect**.

B. Sub-base Course: The compacted granular fill layer between the sub-grade and the Base Course, and/or the pavement base course material. Sub-base material shall be chosen for its compaction and/or stability factors.

C. Base Course: material placed over subgrade or sub-grade course and under other surface treatment, often between the sub-base course and the hot-mix asphalt or concrete paving.

D. Bedding Course: material placed over the excavated subgrade or base course in a trench before laying utilities piping, or under a concrete slab or foundation installation.

E. Drainage Course: material supporting a slab-on-grade that promotes the restriction of upward action of water and moisture.

F. Topsoil excavation: consists of the stripping of all topsoil as is required for the construction of any improvements on the site, and the subsequent stockpiling and/or disposal of the material – as required.

G. Excavation consists of removal of materials encountered below the topsoil to sub-grade elevations indicated, and subsequent disposal of materials not required on-site.

H. Fill/Backfill: material used to bring existing or construction grades to proposed subgrade.

I. Finish Grade: final grade elevation indicated on the drawing. Where not specifically noted a uniform slope between spot elevations except where vertical curves or rounding shall be provided at abrupt changes in slope.
J. Trench: an excavation where the width is less than twice the depth.
K. Structures: Buildings, footings, slabs, curbs, or other man-made stationary features occurring above or below ground surface.
L. Utilities: Underground piping, conduits, storm/sanitary structures, etc. carrying infrastructure.

1.05 QUALITY ASSURANCE:
A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.06 REFERENCES:
A. Refer to MDOT 2003 (or current issue) Standard Specifications for Construction Section 902 "Aggregates" for additional information regarding grading and application restrictions.
B. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate
C. AASHTO T180 - Moisture Density Relations of Soils Using a 10 lb Rammer and an 18 in. drop
D. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates
E. ASTM D698 - Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
F. ASTM D1556 - Test Method for Density of Soil in Place by the Sand Cone Method
G. ASTM D1557 - Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.
H. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
I. ASTM D2419 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate
J. ASTM D2434 - Test Method for Permeability of Granular Soils (Constant Head)
K. ASTM D2487 - Classification of Soils for Engineering Purposes
L. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
M. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures
N. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.07 TESTS:
A. The Contractor will employ a qualified testing laboratory to furnish all of the soil engineering services required for testing and inspections.
B. The testing laboratory will make all tests of materials to determine their suitability for compaction and optimum water content, and will supervise continuously the placing of the fill and backfill.
C. Testing laboratory qualifications: To qualify for acceptance, the geotechnical testing laboratory must demonstrate, to Engineer's satisfaction, based on evaluation of laboratory submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the work.
D. The representatives of the testing laboratory shall have the power of rejection of materials, equipment or operating procedures, of the filling or backfilling operation. The Contractor shall replace, rework or correct work which does not meet the specifications as directed by the testing laboratory and/or the Landscape Architect/Engineer.

1.08 SUBMITTALS:
A. Provide Product Data for the following information/material (as applicable per plans):
1. Geotextile materials
2. Material test reports

3. For reuse of existing soils from excavation or re-spreading as topsoil – perform an analysis to confirm acceptability of material for use.

1.09 PROTECTION OF PERSONS AND PROPERTY:

A. Barricade open excavations occurring as part of this work with barricade construction approved by governing authorities and with warning lights.
B. Site Information:
   1. Verify that survey benchmark and intended elevations for the work are as indicated.
   2. In the case of unsuitable subsoil conditions, notify Architect. A determination of the need for test borings, etc. will then be made.
C. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
D. Existing utilities:
   1. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
   2. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately fir directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   3. Remove from site existing underground utilities indicated to be removed, and interfering with construction. Coordinate with utility companies for shut-off of services if lines are active.
   4. Provide minimum 48-hour notice to Engineer, and receive written notice to proceed before interrupting any utility.
E. Use of Explosives:
   1. Use of explosives is prohibited on this project.
   2. If conditions are uncovered or arise that require the use of explosives, the Contractor shall notify the Owner and Architect in writing, and obtain Owner approval prior to their use. Do not bring explosives onto site or use in work without prior written permission from all relevant authorities having jurisdiction. Comply with all applicable safety codes. Contractor is solely responsible for handling, storage, and use of explosive materials when their Owner-approved use is permitted.
F. Protect landscaping and other features remaining as final work.
   1. Perform excavation by hand within drip line of large trees designated to remain. To the greatest extent possible, protect root systems from damage or “dry out”. Maintain moist condition for root system, and cover exposed roots with moistened burlap.
G. Every effort shall be made to accommodate the public during construction.

1.10 PROJECT RECORD DOCUMENTS:

A. Submit under provisions of Section 01700 Contract Closeout.
B. Accurately stake, record and maintain all Benchmarks and datum information during the entire construction progress.
C. Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - PRODUCTS

2.01 ORDINARY, NATIVE FILL:

A. Composition: shall be natural, inorganic soil, well graded and free from all frozen, organic, weak, expansive or compressive materials and contain no stones or gravel larger than 2 inches in any dimension.

B. Character of soil shall be such that it can be spread and compacted as specified. On-site material may be used as ordinary fill provided it meets these requirements and is approved by the Architect/Civil Engineer prior to placement. Re-use of any native soils shall be preceded by a soil analysis to confirm the acceptability of the material for the intended use.
C. All cut material shall be relocated on site as fill if the material is appropriate for site balance.
D. Stones larger than four (4) inch diameter are not permitted within two feet of the sub-grade and must be will distributed. Refer to "Finish Grading Specifications" for additional restrictions.
E. Boulders larger than six (6) inch diameter are to be removed and disposed of legally off-site.

2.02 SOIL MATERIALS

A. Satisfactory soil materials are defined as those complying with ASTM D-2487 soil classifications groups GW, GP, GM, SW, SP and SM or soils meeting Michigan Department of Transportation (MDOT) Specifications for Class II granular fill.
B. Unsatisfactory soil materials are defined as those complying with ASTM D-2487 soil classifications groups GC, SC, CL, ML, OL, C & H, MH, OH and PT, and not maintained within 2 percent of optimal moisture content.
C. Subsoil: Imported or Excavated material, graded free of lumps larger than 4 inches, rocks large than 2 inches and any debris or deleterious material.
D. Backfill and fill materials. Satisfactory soil materials free of clay, rock or gravel larger than 2 inches in any dimensions, debris, waste, frozen materials, vegetation and other deleterious matter.
E. Topsoil:
    4. Reusable excavated or imported friable loam; free of subsoil, roots, grass, and excessive amount of weeds, large stone (over 1") and foreign matter.
    5. Topsoil is defined as those soils with high organic content that are not suitable for backfill because of their low compressive strength characteristics.

2.03 BASE AND SETTING MATERIALS

A. Blast furnace slag or limestone may be used as fill material in lieu of materials noted when meeting the MDOT classifications and per Sieve Analysis of Fine and Course Aggregates - ASTM C136 for materials required.
B. Sub-base Material:
    1. Natural or artificially graded mixture of natural or crushed gravel or stone, blast furnace slag, and natural or crushed sand meeting ASTM 2940.
    2. Shall meet MDOT 21AA or Class II sand
C. Base Course:
    1. Natural or artificially graded mixture of natural or crushed gravel crushed stone, and natural or crushed sand meeting ASTM 2940.
    2. Shall meet MDOT 21AA or 22A
D. Bedding Course for concrete foundations and slabs:
    1. Natural or artificially graded mixture of natural or crushed gravel crushed stone, and natural or crushed sand meeting ASTM 2940. Choose from the following material based on availability particulars of installation:
        a. Shall meet MDOT 21AA (95% Crushed - 3" x 1" sized) for installation over 21AA base course or Class II sand (60 – 100% passing a 1" sieve) for installation over undisturbed base.
        b. MDOT 30A blast furnace slag maximum size of ¼" meeting ASTM C136.
        c. ¼" x 0 limestone sand
E. Sand to support structural elements:
    1. MDOT Class II – natural sand **shall be used for compacted and engineered back-fill material.** Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials and organic matter, graded in accordance with ANSI/ASTM C136.
    2. Blast furnace slag and/or crushed limestone may be used in place of MDOT Class II as long as it meets the sieve analysis of Class II.

2.04 FILL AND DRAINAGE MATERIALS:

A. Engineered Fill shall be:
   1. Natural or artificially graded mixture of natural or crushed stone, and natural or crushed sand meeting ASTM 2940
   2. Shall meet MDOT 21AA (95% Crushed - 3" x 1" sized) or 22A (25% min. crushed - < ¾" size). Use 22A for best compaction based on interlocking of material.

B. Drainage Course:
   1. Course-aggregate grading size #57 (sieve size between 3/16" and 1") with 95% passing 1" sieve.
   2. Shall meet MDOT 34R – pea gravel, for drainable, bedding material at foundations and strip footings.

C. Filler Material: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel meeting ASTM D 448 and as noted below. The contractor shall have the option to choose from the following graded material as the particular installation warrants:
   a. Large, course-aggregate grading size #24 (sieve size between ¾" and 2-1/2") with 90% passing 2-1/2" sieve.
   b. Course-aggregate grading size #57 (sieve size between 3/16" and 1") with 95% passing 1" sieve.
   c. Shall meet MDOT 34R – pea gravel, for drainable, bedding material at foundations and strip footings.
   d. Class II sand for 95% compaction requirements.

D. Pea Gravel: Natural stone; washed, free of clay, shale, organic matter, graded in accordance with ANSI/ASTM C136:
   1. Minimum Size: 1/8" inch, Maximum Size: ½" inch.
   2. Shall meet MDOT 34R or MDOT #7 (sieve size between 3/16" and 1/2") for use as setting or drainage bed.

E. Impervious Fill:
   1. Clayey gravel and sand mixture capable of compacting to a dense state
   2. Submit material analysis for review prior to placement when Documents note that this material is to by used as a barrier for groundwater migration.

F. Sand for various uses:
   1. MDOT 2NS sand (washed sand) shall only be used for an open, bedding or drainage material since it will not achieve proper compaction. Use for final bedding for pavers or top dressing along drip-line, etc.
   2. MDOT Class II – natural sand shall be used for compacted and engineered back-fill material. Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials and organic matter, graded in accordance with ANSI/ASTM C136.
   3. Blast furnace slag and/or crushed limestone may be used in place of MDOT Class II as long as it meets the sieve analysis of Class II.

2.05 EXPOSED GRANULAR MATERIAL:

A. Path Material - open pathways or splash zone in landscaping areas:
   1. Shall meet MDOT 22x, steel furnace slag for dense, interlocking material that is drainable.
   2. Pea Gravel: Natural stone; washed, free of clay, shale, organic matter, graded in accordance with ANSI/ASTM C136, shall meet MDOT 34R.

B. Exposed coarse stone: Washed natural stone; free of shale, clay, friable material, sand, debris; graded in accordance with ANSI/ASTM C136 - graded within the following limits:
   1. Average Minimum Size: ½ inch, maximum Size: 1-1/2 inch
   2. Sieve size 6A

2.06 ACCESSORIES:

A. Geotextile Fabric: Non-biodegradable, woven, medium weight fabric manufactured by US Fabrics Inc., or equal.
   a. Tensile strength shall conform to ASTM D-4632 and meet or exceed 200.
   b. Mullen Burst shall conform to ASTM D-3786 and meet or exceed 400 psi.

B. Filter Fabric: Non-biodegradable, woven, mono-filament fabric manufactured by US Fabrics Inc., or equal.
   a. Fabric shall be used in conjunction with riprap, retaining walls and bulkhead installations.
   b. Tensile strength shall conform to ASTM D-4632 and meet or exceed 370 x 250.
   c. Percent Open Area shall conform to COE-022125 and meet 4 -6 % open.

2.07 REFERENCE INFORMATION:

Sieve Size	Percent Passing
2 inches	100
1 inch	95
3/4 inch	95 to 100
5/8 inch	75 to 100
3/8 inch	55 to 85
No. 4	35 to 60
No. 16	15 to 35
No. 40	10 to 25
No. 200	05 to 10

PART 3 – EXECUTION

3.01 BASIS OF CONTRACT:
A. Extent of work shall be that necessary to cut and/or fill to obtain the cross-Sections and elevations indicated or required on the plans.
B. Examine the areas and conditions under which excavating filling and grading are to be performed and notify the Consultant, in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.
C. Identify required lines, levels, contours and datum.
D. Maintain and protect existing construction and utilities to remain.
E. **Verify foundation or basement walls are adequately braced to support surcharge of lateral forces imposed by backfilling operations.**

3.02 PROTECTION OF PERSONS AND PROPERTY:
A. Barricade open excavations occurring as part of this work with barricade construction approved by governing authorities and with warning lights.
B. Site Information:
   1. Verify that survey benchmark and intended elevations for the work are as indicated.
   2. In the case of unsuitable subsoil conditions, notify Architect. A determination of the need for test borings, etc. will then be made.
C. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
D. Existing utilities:
   1. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
   2. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately fir directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   3. Remove from site existing underground utilities indicated to be removed and interfering with construction. Coordinate with utility companies for shut-off of services if lines are active.

4. Provide minimum 48-hour notice to Engineer, and receive written notice to proceed before interrupting any utility.

E. Use of Explosives:
1. Use of explosives is prohibited on this project.
2. If conditions are uncovered or arise that require the use of explosives, the Contractor shall notify the Owner and Architect in writing, and obtain Owner approval prior to their use. Do not bring explosives onto site or use in work without prior written permission from all relevant authorities having jurisdiction. Comply with all applicable safety codes. Contractor is solely responsible for handling, storage, and use of explosive materials when their Owner-approved use is permitted.

F. Protect landscaping and other features remaining as final work.
1. Perform excavation by hand within drip line of large trees designated to remain. To the greatest extent possible, protect root systems from damage or "dry out". Maintain moist condition for root system, and cover exposed roots with moistened burlap.

G. Every effort shall be made to accommodate the public during construction.

3.03 PROTECTION OF ADJACENT WORK
A. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
B. Grade excavation top perimeter to prevent surface water run-off into excavation or to adjacent properties.

The following sections are separated into 3 parts: 3A – Excavation; 3B – Setting of Aggregate Material and Backfilling; 3C – Grading and Schedules.

PART 3A – EXCAVATION

3A.01 GENERAL EXCAVATION:
A. Method shall be open cut or tunneling/boring where desirable for the protection of neighboring surfaces, structures, plants, workmen, and or the public.
B. Extent shall be as required for the proposed structures allowing ample room for construction (form work, dewatering, etc.) and inspection.
C. Tolerance shall be within 0.10' of the proposed subgrade.
D. Subgrade Preparation: bottom of excavation for slabs, foundations, etc. shall be cleaned, trimmed and leveled as required for the installation immediately prior to placement of base or foundation.
E. Excess Excavation or disturbed subgrade that requires excavation beyond the prescribed limits shall be replaced with Granular Backfill or 2,000 psi Concrete at the discretion of the Consultant. All replacement shall be at the Contractor's expense.
F. Inspection of the subgrades by the Consultant shall take place prior to placement of any base or structure. The Contractor shall provide proper advance notification.
G. Excavated Material shall be stockpiled as directed by Consultant. Excess excavated material shall be disposed of on-site as directed by Consultant.
H. Protect excavation for footings against freezing when atmospheric temperature is less than 35 degrees F.

3A.02 DEWATERING
A. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area. This work shall be performed in accordance with the requirements of all soil erosion and sedimentation control agencies.
1. Do not allow water to accumulate in excavations. Remove water to prevent soil changes detrimental to stability of sub-grades. Provide and maintain pumps, well points, sumps, suction, and discharge lines and other dewatering system components necessary to convey water away from excavations.

2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

B. The Contractor shall remove all water that accumulates in any excavation. The Contractor is responsible for any cost of dewatering, maintaining the dewatering until the structure can be placed and any damage caused by the dewatering process.

3A.03 STABILITY OF EXCAVATIONS:

A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3A.04 PREPARATION:

A. Identify required lines, levels, contours, and datum.
B. Stake and flag locations of known utilities.
C. Locate, identify, and protect utilities that remain, from damage.
D. Notify local utility company to locate and identify all utilities.
E. Protect above and below grade utilities that remain.
F. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
G. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
H. Cut out soft areas of subsoil not readily capable of compaction. Backfill with subsoil and compact to density equal to requirements for subsequent backfill material.
I. Prior to placement of aggregate base course material, verify and/or compact subsoil to 95% of its maximum dry density in accordance with ANSI/ASTM D698, D2167 or D2922.

3A.05 SUBSOIL EXCAVATION:

A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
B. Excavate wet subsoil and process wet material to obtain optimum moisture content.
C. When excavating through roots, perform work by hand and cut roots with sharp axe.
D. Remove subsoil not required from site balancing from site.
E. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.
F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3A.06 TOPSOIL EXCAVATION;

A. Excavate topsoil from areas to be further excavated or re-graded and stockpile in area as directed by Landscape Architect/Engineer.
B. Do not excavate wet topsoil.
C. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
D. Dispose of excess excavated soil material, excess topsoil, and materials not acceptable for use as backfill or fill of site at no additional cost to Owner.
E. Stockpile topsoil to depth not exceeding 8 feet. Seed to protect from erosion if needed.
F. Restore stockpile are to situation prior to use, or to match adjacent areas at the direction of the owner.

3A.07 TRENCHING

A. Coordinate with Section 02225 – Trenching for additional information.
B. Excavate for utilities as required.
C. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
D. Hand trim excavation and leave free of loose matter.

E. Support pipe and conduit during placement and compaction of bedding fill.
F. Backfill trenches to required contours and elevations.
G. Place and compact fill materials as for Backfilling.

3A.08 EXCAVATION FOR UTILITY LINES:

A. Depth shall allow for pipe bedding. Hand trim excavation where required. Hand trim for bell and spigot pipe joints. Remove loose matter.
B. Width shall be wider and deeper at each joint to provide for properly completing the pipe joint and relieve the joint of all loadings. Width at the pipe shall provide a maximum clearance of 12 inches and minimum clearance of 6 inches on each side of the pipe. Width at top of excavation shall be as narrow as practicable.
C. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd, measured by volume.
D. Sheeting/bracing shall be used where the trench is in close proximity to existing structures or the ground conditions require. Remove sheeting/bracing as backfilling progresses. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing down as excavation progresses. Provide materials for shoring and bracing in good serviceable condition.
E. Exposed existing utilities shall be adequately supported during operations and given a permanent support meeting the utility Owner or agency's standards and such that they will not be damaged by later settlement. Any damage to existing utilities shall be repaired at the Contractor's expense to the requirements of the utility-owner's or agency's satisfaction.

3A.09 UNSUITABLE BEARING MATERIALS:

A. Definition: Material inside building lines, under exterior walls, steps, paved areas, foundations, structures, etc. of the following characteristics:
   1. Topsoil and loam.
   2. Peat, organic soil, sod, wood, roots or other matter subject to decay.
   3. Soft, spongy or compressible soil.
B. Removal of all unsuitable materials shall take place prior to construction. If unsuitable material is encountered at the required sub-grade elevation, the Contractor shall remove the unsuitable material and replace with Granular Backfill up to one additional foot at no added cost. If further excavation and backfill is required and approved by the Consultant, the Contractor will be paid on the basis of informative prices in the proposal form.

PART 3B – SETTING OF AGGREGATE MATERIAL AND BACKFILLING

3B.01 GENERAL FILLING AND BACKFILLING:

A. Preparations:
   1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or brake up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
   2. When existing ground surface has density less than that specified under "Compaction" for particular area's classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
   3. Remove all form work, debris and other deleterious material unless otherwise specified.
B. Filling over rubble:
   1. It is the responsibility of the Contractor to completely choke all voids in such a manner as to stop all infiltration of fill placed above rubble, if approval to place fill over rubble is given by the Consultant.
C. Subgrade must be dry and compacted to insure that it shall have adequate density to support subsequent fill without undue settlement.

D. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Each layer shall meet the following maximum unit densities in accordance with ASTM D-1557:
   1. Ordinary Fill 90% Aggregate Base and Granular Fill/Base/Sub base 95%
E. No Filling shall take place in unfavorable weather as determined by the Consultant.
F. Maintain subgrades at levels specified until scheduled for subsequent construction. Correct all settlement occurring after required rough grades are obtained, and any later damage resulting there from.
G. Moisture Control:
   1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
   2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
   3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.
H. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. If soil density tests indicate inadequate compaction, correct improperly compacted areas or lifts as directed by Engineer.
   1. Percentage of maximum density requirements for compact sand - not less than the following percentages of maximum, density, in accordance with the Standard Proctor Test, ASTM D 698, or the Michigan Cone Test:
      a. Under structures, slabs, and pavements, compact top 12 inches of sub-grade and each layer of backfill of fill material at **95 percent** maximum density.
      b. Under lawn or unpaved areas, compact top 6 inches of sub-grade and each layer of backfill or fill material at **90 percent** maximum density.
      c. Under walkways, compact top 6 inches of sub-grade and each layer of backfill or fill material at **95 percent** maximum density.
   2. Percentage of maximum density requirements for compact gravel - not less than the following percentages of maximum density, in accordance with the Standard Proctor Test, ASTM D 698 or the Michigan Cone Test.
      a. Under pavements, compact top 6 inches of base and each layer of backfill of material at **98 percent** maximum density.
I. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below:
   1. Under topsoil at grassed or planted area, use satisfactory ordinary fill material to 6 below finish grade.
   2. Under slabs, walks and pavements: Use Base Course or granular fill material.
J. Backfill excavations as promptly as work permits, but not until the completion of the following:
   1. Review by Consultant of construction below finished grade.
   2. Inspection, testing, approval and recording locations of underground utilities.
   3. Removal of trash and debris.

3B.02 BACKFILLING FOR BUILDINGS:

A. Employ a placement method that does not disturb or damage foundation perimeter drainage foundation damp-proofing, foundation waterproofing or protective cover.
B. Maintain optimum moisture content of backfill materials to attain required compaction density.
C. Backfill against supported foundation walls. Do not backfill against unsupported foundation walls.
D. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
E. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise.
F. Make grade changes gradual. Blend slope into level areas.

G. Remove surplus backfill materials from site.

3B.03 BACKFILLING FOR UTILITY LINES:

A. Backfill only after pipes have been inspected, tested and locations of pipes and appurtenances have been recorded.
B. Backfill trenches to contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural settlement.
C. Do not backfill over porous, wet or spongy sub-grade surfaces. Maintain optimum moisture content of backfill materials to attain required compaction density, 95% modified proctor density ASTM D1557 within the zone of influence for all buildings and pavement, 90% modified proctor density ASTM D1557 under lawn areas
D. Support pipe during placement and compaction of Class II bedding fill.
E. Place by hand Granular Backfill to a depth of one foot above the pipe. Tamp firmly in layers not exceeding six inches, taking care not to disturb the pipe.
F. Under Pavements, structures, etc. use Granular Backfill as described under General Filling and Backfilling of this Section.
G. Other Areas use Ordinary Backfill as described under General Filling and Backfilling of this Section.

PART 3A – GRADING AND SCHEDULES:

3C.01 GRADING:

A. General: uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
B. Grading outside building lines: grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
    2. Walks: shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.10 foot above or below required sub-grade elevation.
C. Subsurface installations: grade to allow for installation of compactable material forming base for concrete or other structures.
D. Compaction: after grading, compact sub-grade surfaces in areas to be paved to the depth and indicated percentages of maximum or relative density for each area classification.
    1. Extent shall be areas within limits of work indicated on the plans including any adjacent transition areas.
    2. Tolerance within 0.10' of the proposed subgrade
    3. Degree of Finish shall be that which is ordinarily obtainable from a blade-grader or dozer back-blade operations.
E. Uniformity: Contractor shall finish all grading surfaces within specified tolerance providing uniform slopes between given elevations and rounding land forms as directed by Consultant.
F. Review of subgrade land form contour by Consultant is required prior to placement of topsoil or any structures.
G. Minor Changes as directed by Consultant shall be at no extra cost to the Owner.
H. Correction of subgrade is required wherever settlement, erosion or other grade changes have occurred.

3C.02 MAINTENANCE AND GUARANTEE:

A. Protection of graded areas. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
C. Reconditioning compacted areas. Where completed areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
E. Settlement within a one-year period after final acceptance shall be brought to proper grade by the Contractor at no expense to the Owner. Any surface features (i.e. pavements, structures, etc.) disturbed or damaged by settlement shall be repaired or replaced as determined by the Consultant at no expense to the Owner.

3C.03 SCHEDULE:

A. Exterior strip footing and foundation wall bearing:
   1. Bed Course material or Class II sand compacted to 95%
   2. Choose material that will compact and provide a stable, interlocked base.
   3. Provide suitable depth over sub-base to provide stable bedding
B. Exterior side of Foundation Walls, Retaining Walls and Over Granular Filter Material:
   1. See Section 02200. 2.04 – Fill and Drainage Materials for various materials suitable for this type of installation.
C. Interior side of Foundation Walls, Retaining Walls and Over Granular Filter Material:
   1. See Section 02200. 2.04 – Fill and Drainage Materials for various materials suitable for this type of installation.
   2. Coordinate with Documents and interior construction for suitable material in this application including optional drainage course if noted.
   3. Typical material shall be MDOT 21AA or Class II sand compacted to 95% density.

END OF SECTION 02200

SECTION 02218 – FINISH GRADING

PART 1 – GENERAL

1.01 WORK INCLUDED:
- A. Finish grade subsoil and proof roll.
- B. Amend topsoil if required
- C. Place, level and compact topsoil.

1.02 RELATED SECTIONS:
- A. Drawings and general provisions of the Contract, including General, Supplementary and Special Conditions and Division 1 specification sections, apply to the work of this section.
- B. Section 01400 – Field Engineering and Quality Control Services.
- C. Section 02110 - Site Preparation
- D. Section 02200 – Earthwork – coordinate for soil materials
- E. Section 02923 – Fine Grading and Grasses

1.03 PROTECTION:
- A. Protect landscaping and other features remaining as final work.
- B. Protect existing structures, fences, roads, sidewalks, paving and curbs.

1.04 SUBMITTALS:
- A. Submit a certified analysis of topsoil from each off-site source prior to delivery. Deficiencies from specified requirements shall be corrected. Contractor to propose corrective measures, if necessary, to Engineer for approval prior to implementing.

PART 2 – PRODUCTS

2.01 MATERIALS:
- A. Topsoil from off-site shall be fertile, friable, natural loam capable of supporting optimal plant growth and development. Topsoil material shall be reasonably free of subsoil, clay lumps, brush, viable plant parts, weeds and other litter, and free of roots, stumps, stones larger than 1" in any dimension, and other extraneous or toxic matter harmful to plant growth. Its mineral and organic components shall be homogeneously mixed.
- B. Reuse stockpiled topsoil and blend with outsourced soils.
- C. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well–drained sites where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes.
- D. Topsoil from off-site source shall meet the following criteria:
  1. PH range between 5.0 and 7.5
  2. Soluble salts maximum 500 parts per million (ppm)
  3. Organic content between 5 and 30%
  4. Clay content between 5 and 25%

PART 3 – EXECUTION

3.01 INSPECTION:
- A. Verify site conditions and note irregularities affecting work of the section.
- B. Beginning work of this section means acceptance of existing conditions.

3.02 SUBSOIL PREPARATION:

A. Eliminate uneven areas and low spots. Remove stones, roots, branches and other extraneous matter in excess of 1/2" in size in any dimension. Remove any subsoil contaminated with petroleum products and dispose of such contaminated material off-site in a legal manner.
B. Scarify sub-grade to depth of 2" where topsoil is indicated. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil. Scarified lines shall be perpendicular to slopes.

3.03 TOPSOIL PREPARATION:
A. Correct deficiencies to stockpiled topsoil or topsoil from offsite per Section 2.01 above.

3.04 PLACING TOPSOIL:
A. Spread topsoil to a minimum depth as indicated in specifications.
B. Use topsoil in relatively dry state. Place during dry weather.
C. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours or subgrade.
D. Remove stone, roots, grass, weeds, debris and foreign material while spreading.
E. Manually spread topsoil around trees to prevent damage.
F. Lightly compact placed topsoil. In areas to be seeded, lightly hand rake top surface to produce a fine, pulverized seed bed.
G. Remove surplus subsoil and topsoil from area being finished to areas of site as directed by Landscape Architect/Engineer.
H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.05 TOLERANCES:
A. Top of topsoil: Plus or minus 0.1 foot.

END OF SECTION 02218

02513 - ASPHALT CONCRETE PAVING - to be used as Reference

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:
- A. This Section includes provisions for asphaltic concrete paving over a properly prepared sub-base, including lane-marking work.
- B. Installing and properly compacting sub-base material
- C. Providing and installing tactile warning mats at Barrier-Free ramps and locations
- D. Proof rolling of prepared sub-base is included in this Section
- **E. This Section is used as Reference, for patching required during construction and for striping and wheel stops required by the Documents.**

1.02 SECTION INCLUDES:
- A. Base Courses and Preparation for Asphalt Paving
- B. Asphalt concrete parking areas - public access
- C. Patching of existing asphaltic paving
- D. Surface Finishing
- **E. Lane markings and parking configurations.**
- **F. Wheel stops (concrete bumpers)**

1.03 RELATED SECTIONS:
- A. Section 02110 - Site Preparation.
- B. Section 02200 - Earthwork - for subgrade preparation, grading and sub-base course
- C. Section 02218 - Finish Grading
- D. Section 02514 – Portland Cement Concrete Paving
- E. Section 02936 - Fine Grading and Grasses
- F. Section 02950 – Trees, Shrubs and Grading

1.04 REFERENCES:
- A. Michigan Department of Transportation (MDOT), Standard Specifications for Construction, latest edition.
- B. State of Michigan Soil Erosion and Sedimentation Act of 1972, as amended, and all local ordinances
- C. American Society for Testing and Materials (ASTM) applicable standards

1.05 QUALITY ASSURANCE:
- A. Reference Specifications:
  1. All aggregate subbase materials, asphalt concrete pavement materials and their placement shall be in accordance with the relevant sections of the Michigan Department of Transportation (MDOT) Standard Specifications, latest edition.
     - a. If a conflict exists between these Specifications and the MDOT Specifications, the MDOT specifications shall govern.

1.06 SUBMITTALS:
- A. Material Certificates:
  1. Provide copies of material certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
  2. Job Mix Designs.

1.07 JOB CONDITIONS:
- A. Weather Limitations:

1. Apply prime and tack coats only when ambient temperature is above 50 degrees F. (10 degrees C.), and when temperature has not been below 35 degrees F. (1 degree C.) for 12 hours immediately prior to application. Do not apply when base is wet or contains excess of moisture.
2. Construct asphalt concrete surface course only when atmospheric temperature is above 40 degrees F. and when base is dry. Base course may be placed when air temperature is above 30 degrees F. and rising.
3. Proceed with pavement marking only on clean, dry surfaces with a surface temperature of 40 deg F. for oil-based materials and 50 deg F. for water-based materials, and not exceeding 100 deg F.

B. Grade Control:
1. Establish and maintain required lines and elevations.
2. In areas to receive asphalt concrete paving, provide minimum 1/8”/ft. slope for proper drainage.

C. Permits and Approvals:
1. Contractor shall obtain all permits and approvals as required to perform work for this project from the applicable local and state regulatory bodies and to pay for all costs incidental thereto.

1.08 QUALITY CONTROL:

A. Contractor will furnish Testing Laboratory to monitor quality control during paving operations.
1. Testing Firm will monitor and document following information for submission to Owner:
a. Mix temperatures
b. Mix specification compliance
c. Control of paving thickness within minimum tolerance
d. General compliance with specifications

B. Testing Firm may, at Owner's discretion, obtain random core samples to confirm compliance with minimum thickness tolerance.

C. Testing Firm will be responsible for documentation of problems and implemented solutions. Information shall be submitted to Owner for inclusion into Record Drawings, which will be submitted to Owner's Maintenance Department for future reference.

D. Prior to final, formal acceptance of paving areas, final inspection will be held and will involve Contractor, Testing Firm, and Engineer.

E. Testing Firm will be responsible for documenting inspection, including participants, observations, and comments, and will establish second inspection approximately 1 year after original inspection. Second meeting will be mandatory for participants, and is intended to occur within 1-year warranty period. Failure and problem areas will be investigated by participants for determination of failure and responsibility for corrections. Implementation of necessary corrections or repairs and follow-up will be responsibility of Contractor.

F. Testing Firm will be responsible for taking random 3 inch by 5-inch color photographs of paved areas during first and second inspections, and after corrections have been made on observations made during second inspection.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. General:
1. Use locally available materials and gradations that exhibit a satisfactory record of previous installations.
a. Materials, equipment, and provisions shall be those specified for, and shall conform to applicable provisions of Standard Specifications For Construction as adopted by Michigan Department of Transport Supplemental Specifications that apply.

B. Aggregate materials:
1. Sub-base Course Aggregate:

a. Sound, angular crushed stone, crushed gravel, or properly cured, crushed blast furnace slag, complying with ASTM D 692 and Section 3.01 of MDOT Standard Specifications, latest edition.
b. Provide Type 21A or 22A aggregate.
c. Compact to 95% maximum dry density – typical

2. Base or leveling Fine Aggregate:
a. Sharp-edged natural sand, 2NS or Class II, or sand prepared from stone, properly cured blast furnace slag, gravel, or combinations thereof, complying with ASTM D-2940.
b. Compact to 95% maximum dry density – typical

C. Asphalt Materials:
1. Asphalt Binder: AASHTO <P 1, PG 64-22 – unless noted otherwise
2. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-250 U.N.O.
3. Tack Coat: **Per City of Ann Arbor: use MDOT SS-IH bond coat**, or ASTM D977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt – suitable grade and consistency for application.
4. Mineral Filler:
a. Rock, slag, or limestone dust, portland cement, or other inert material complying with AASHTO M 17 (ASTM D 242)
5. Asphalt Cement:
a. ASTM D 3381 for viscosity-graded material
b. ASTM D 946 for penetration-graded material

2.02 ASPHALTIC MATERIAL AND INSTALLATION:

A. Bituminous pavement - Construct bituminous pavement in two courses as follows:
1. Bituminous base course: MDOT 13A Mix or as shown on the plans.
a. Comply with MDOT 13A - Standard Specifications (1100T – 20AA), MDOT latest edition.
b. Grade of asphalt cement shall be Penetration Grade 85-100 or Viscosity Grade A.C. - 10.
c. Percent bitumen in mixture - 5 percent to 7 percent
d. Install in 3” course lift, or as noted in documents. Thickness of leveling course shall be as shown on the plans.
2. Bituminous surface (wearing and leveling) course: MDOT 13A Mix or as shown on the plans.
a. Comply with MDOT 13A - Standard Specifications (1100T – 20AA), MDOT latest edition.
b. Grade of asphalt cement shall be Penetration Grade 85-100 or Viscosity Grade A.C. - 10.
c. Percent bitumen in mixture - 5 percent to 7 percent
d. Install in 2” course lift, or as noted in documents. Thickness of surface course shall be as shown on the plans.
3. Bituminous surface patching and wedging course: MDOT 13A Mix or as shown on the plans.
a. Comply with MDOT 13A - Standard Specifications (1300T – 20AAA), MDOT latest edition.

2.03 MATERIALS FOR SEAL COAT:

A. General: Materials, equipment, and provisions shall be those specified for, and shall conform to applicable provisions of Section 506.02 of the Standard Specifications For Construction as adopted by the Michigan Department of Transportation (MDOT) and MDOT Supplemental Specifications that apply.

2.04 ACCESSORIES:

A. Lane Marking Paint:

1. Latex, waterborne emulsion, lead and chromate free, ready mix, complying with FS TT-P-1952. Color shall be:
   a. Color: White stripes typical parking bays.
   b. Color: Blue stripes at Barrier Free markings.
   c. Parking areas will be completed with standard white, 4" wide stripes with blue striping for handicapped spaces and any Barrier-Free signage as required, in areas shown.

B. Concrete Bumpers:
1. Bumper Construction:
   a. Cement: ASTM C150, Portland Type 1 - Normal; white color.
   b. Concrete Materials: ASTM C33; water and sand.
   c. Reinforced Steel: ASTM A615, deformed steel bars; unfinished, strength and size commensurate with precast unit design.
   d. Air Entrainment Admixture: ASTM C260.
2. Concrete Mix: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent.
3. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture.
4. Embed reinforced steel, and drill or sleeve for two dowels.
5. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
6. Normal Size: 6 inches high, 6 inches wide, 6 feet long.
7. Normal concrete color.

C. Protective Surface Treatment
1. JETCOAT 707 as manufactured by The Jetcoat Company, Columbus, Ohio 43216 and COLFIX JET SEAL as manufactured by Chevron Asphalt Company, San Francisco, California 94120, or other approved equal pitch coat tar emulsion following Federal Specification R-P-335d may be used.
2. Regardless of which product is used, application must be as recommended for moderate traffic and equal to Maintenance, Inc. General Application Specification JA-SI.

PART 3 – EXECUTION

3.01 MAINTAINING TRAFFIC, PUBLIC CONVENIENCE, AND SAFETY:

A. Convenience and access:
1. Conduct work at times to ensure least possible obstruction to existing traffic and inconvenience to general public and residents in vicinity of work, and to ensure access of persons to abutting properties in manner approved by Engineer. No road or street shall be closed to public except with permission of Engineer and proper government authorities. Emergency vehicles shall have access at times, and shall be assisted by Contractor, if necessary. Near end of day's work, Contractor shall remove obstructions, which would make access difficult or impossible.
2. Confer with, and keep, police and fire departments of municipality fully informed as to streets, which are to be closed to traffic for construction purposes. Fire hydrants on or adjacent to work shall be kept accessible to fire fighting equipment at all times.
3. Temporary provisions shall be made to ensure proper functioning of gutters, sewer inlets, and drainage ditches.

B. Lights, signs, and barricades:
1. Provide adequate warning signs, barricades, lights, and flaggers, and take necessary precautions for protection of work and safety of workers and of general public. Streets, roads, highways, alleys, and other areas accessible to public, which are closed to traffic, shall be protected by means of effective barricades on which shall be placed approved warning signs.
2. Open trenches and other excavations shall be provided with suitable barriers, signs, and lights to extent that adequate protection is provided to public against accident by reasons

of such open construction. Obstructions, such as material piles and equipment, shall be provided with similar warning signs and lights.

3. Barricades, signs, lights, and other protective devices shall be installed and maintained in conformity with applicable statutory requirements, and where within railroad and highway rights-of-way, as required by authority having jurisdiction.

C. Dust control:

1. Keep paved surfaces and access routes cleaned and free of debris, and control dust from construction operations by application of water, salt, chloride or by other approved means. If Contractor fails to correct unsatisfactory conditions promptly after due notification, Engineer will arrange for work to be performed by other means, and will deduct cost thereof from monies that are due or may become due to Contractor.

3.02 PAVEMENT SUBBASE COURSE:

A. Preparation:

1. The subgrade shall be smoothed, compacted and trimmed to the required line, grade and cross section to receive the aggregate subbase material.

B. Placing:

1. Placing sub-base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase materials during placement operations.
2. When a compacted subbase course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

C. Grading:

1. Grade and fine grade to required line, grade and cross section. Surface shall be smooth and dense. Maintain optimum moisture content during grading operations.

D. Compaction:

1. Compact each layer to not less than 98% of Maximum Unit Weight per AASHTO T-180 test.

E. Grade Control:

1. During construction, maintain lines and grades, including crown and cross-slope of subbase course.
2. Maintain min. of 1/8” per foot positive slope to drain.
3. Should aggregate sub-base be damaged, Contractor shall restore subbase to a smooth, compacted condition at no additional cost to the Owner.

3.03 SURFACE PREPARATION:

A. General:

1. Remove loose material from compacted sub-base surface immediately before applying prime coat.
2. Proof roll prepared subgrade surface to check for unstable areas and areas requiring additional compaction.
3. Notify Contractor of unsatisfactory conditions. Do not begin paving until deficient sub-base areas have been corrected and areas are ready to receive paving.
4. Allow surface to dry until at proper condition to receive paving.
5. Exercise care in applying bituminous materials to avoid smearing of adjoining surfaces. Remove and clean damaged surfaces.

3.04 PLACING MIX:

A. General:

1. Place asphalt concrete mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 degrees F. (107 degrees C.). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.

B. Asphalt Pavement Placing:

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated herein or on the Documents in Detailed Sections.
2. Place hot-mix asphalt surface (wear) course in a single lift in thicknesses indicated.
3. Begin placing along centerline of areas to be paved on a crowned section, and at high side of sections with a one-way slope, and in direction of traffic flow.
4. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
5. If more than 72 hours have elapsed between placement of asphalt concrete base course and the anticipated placement of the wearing course or if the base course has become contaminated with dirt, dust or other foreign materials, apply bond coat to surface of base course prior to placing of surface course. Distribute at rate of 0.05 to 0.15 gallons per sq. yd. of surface. Allow to dry until at proper condition to receive paving.
   a. Remove dirt, dust or other foreign material from base course immediately before applying bond coat.

C. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.

3.05 FIELD ENGINEERING FOR PLACEMENT OF ASPHALT – SPECIAL CONDITIONS:

A. It is this Contractor's responsibility to verify appropriate grades, slopes and tolerances and address any code non-conformity prior to asphalt paving.

B. Verify compacted subgrade is ready to support paving and imposed loads

C. Comply with tolerances of ACI 117 and as follows:
   1. elevation tolerance: ¼"
   2. thickness: plus 3/8"
   3. surface variations: gap below a 10-foot-long straight edge not to exceed ¼"

D. For surfaces required to meet ADA requirements:
   1. maximum cross slope for walks, ramps and platforms – less than 2%
   2. maximum longitudinal walk slope not requiring landing and handrails – 5%
   3. maximum longitudinal ramp slope with hand/guardrails – 8.33% (1 : 12)

E. Beginning of installation means acceptance of existing conditions

3.06 JOINTS IN PAVEMENT:

A. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have some texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat. All joints shall be parallel or perpendicular to other joints.

B. Offset longitudinal joints, in successive courses, a min. of 6 inches.

C. Offset transverse joints, in successive courses, a min. of 24 inches.

D. Compact asphalt at joints to a density within 2 percent of specified course density.

3.07 ROLLING:

A. General:
   1. Begin rolling when mixture will bear roller weight without excessive displacement.
   2. Compact base course to a density of 95% of the maximum Marshal Unit Weight (50 blows). Compact wearing course to a density of 98% of the maximum Marshal Unit Weight (50 blows).
   3. Compact mixture with hot hand tampers or vibrating plate compactors in areas of inaccessible to rollers.

B. Breakdown Rolling:
   1. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

C. Second Rolling:

1. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

D. Finish Rolling:
1. Perform finish rolling while mixture is warm enough for removal of roller marks. Continue rolling until all roller marks are eliminated and course has attained maximum density.

E. Patching:
1. Use appropriate mixture for patching and/or wedging.
2. Remove and replace areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot asphalt concrete.
3. Compact by rolling to maximum surface density and smoothness as required.

F. Protection:
1. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened sufficiently to prevent damage from traffic.
2. Erect barricades to protect paving from traffic until mixture has cooled and attained its maximum degree of hardness.

3.08 TRAFFIC AND LANE MARKINGS:

A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
B. Pavement Striping: Use latex base, traffic lane-marking paint, factory-mixed, quick-drying, and non-bleeding.
C. Allow paving to age for 30 days before starting pavement marking.
D. Traffic and lane markers shall be a 4” wide stripe painted white.
E. Do not apply traffic and lane marking paint until layout and placement have been verified with Architect/Engineer.
F. Apply paint with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates to provide minimum 12 to 15 mils dry thickness.
G. Coordinate and install parking bumpers with all traffic and parking bay markings – as indicated on documents or as required.

3.09 SURFACE TREATMENT INSTALLATION:

A. General:
1. Preparation, installation and protection of surface treatment shall be in strict accordance with individual provisions of these Specifications, the surface treatment manufacturer’s recommendations, and/or the applicable provisions of Section 506.03 of the MDOT Standard Specifications for Construction, latest edition, whichever is most strict.

B. Applications:
1. Asphalt concrete paving shall be fully cured, structurally sound and free of foreign matter. Clean surface of dirt and loose materials immediately before application of surface treatment. Fog spray dampen surface with clean fresh water. No puddles or excess water shall be allowed.
2. Apply two coats of surface treatment at a rate so as to provide a total coverage rate of 0.16 to 0.20 gallons per sq. yd. per coat. Comply with manufacturer’s recommendations and instructions regarding drying treated surfaces before opening them to traffic.

3.10 FIELD QUALITY CONTROL:

A. General:
1. Test in-place asphalt concrete courses for compliance with requirements of MDOT for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Architect.
2. In-place density: testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
a. Reference max. theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site according to ASTM D 2041.

3. Remove and replace or install additional hot-mix asphalt where test results do not comply with specified requirements.

B. Thickness:
   1. In-place, compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
      a. Base Course: plus or minus 1/2"
      b. Surface Course: plus or minus 1/4".

C. Surface Smoothness:
   1. Using 10' straightedge applied parallel with, and at right angles to centerline of paved area, the surfaces will not be acceptable if exceeding the following tolerances for 'flatness':
      d. Single Course Application: 1/4"
      e. Wearing Course Surface: 3/16"
      f. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
      g. Check surface areas at intervals as directed by Engineer.

END OF SECTION 02513

SECTION 02514 - PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:
- A. This Section includes provisions for Portland cement concrete paving over prepared sub-base, including lane-marking work.
- B. Installing and properly compacting sub-base material
- C. Providing and installing tactile warning mats at Barrier-Free ramps and locations
- D. Proof rolling of prepared sub-base is included in this Section.

1.02 WORK INCLUDED:
- A. Base courses and preparation for Concrete Paving
- B. Concrete walks and other flatwork
- C. Curb and gutters – if required by field conditions after demolition
- D. Localized grading and setting aggregate base for walks and flatwork
- E. Reinforcement, joint materials, curing and protection
- F. Surface finish, tooling, including locating and setting tactile warning mats in concrete
- G. Lane markings and parking configurations
- H. Wheel stops (concrete bumpers)

1.03 RELATED SECTIONS:
- A. Section 02110 - Site Preparation
- B. Section 02200 – Earthwork - for subgrade preparation, grading and sub-base course
- C. Section 02218 - Finish Grading
- D. Section 02513 – Asphalt Concrete Paving
- E. Section 02936 - Fine Grading and Grasses
- **F. Section 03300 – Concrete Work for coordination with stairway**

1.04 REFERENCES:
- A. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving.
- B. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement
- C. ASTM C33 - Concrete Aggregates
- D. ASTM C94 - Ready Mixed Concrete
- E. ASTM C150 - Portland Cement
- F. ASTM C260 - Air-Entraining Admixtures for Concrete
- G. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete
- H. ASTM C494 - Chemical Admixture for Concrete
- **I. Michigan Dept. of Transportation (MDOT) 2003 (or latest Edition) Standard Specification for Construction**

1.05 QUALITY ASSURANCE:
- A. Obtain materials from same source throughout.
- B. **Perform work in accordance with Michigan Dept. of Transportation (MDOT) 2003 (or latest Edition) Standard Specification for Construction.**
- C. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment and approved by authorities having jurisdiction or MDOT

1.06 SUBMITTALS:
- A. Submit product data on joint filler, admixtures and curing compounds.
- B. Provide copies of material certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
- C. Job Mix Designs
- D. Submit product data in a timely fashion for review prior to commencement of Work.

1.07 JOB CONDITIONS:

A. Weather Limitations:
   1. Construct concrete surface course only when atmospheric temperature is above 40 degrees F. and when base is dry. Base course may be placed when air temperature is above 30 degrees F. and rising.
   2. Proceed with pavement marking only on clean, dry surfaces with a surface temperature of 40 deg F. for oil-based materials and 50 deg F. for water-based materials, and not exceeding 100 deg F.

B. Grade Control:
   1. Establish and maintain required lines and elevations.
   2. In areas to receive concrete paving, provide minimum 1/8”/ft. slope for proper drainage.

C. Permits and Approvals:
   1. Contractor shall obtain all permits and approvals as required to perform work for this project from the applicable local and state regulatory bodies and to pay for all costs incidental thereto.
   2. Do not place concrete on frozen base, or when rain is threatening.

1.08 QUALITY CONTROL:

A. Contractor will furnish Testing Laboratory to monitor quality control during paving operations.
   1. Testing Firm will monitor and document following information for submission to Owner:
      a. Mix temperatures
      b. Mix specification compliance
      c. Control of paving thickness within minimum tolerance
      d. General compliance with specifications
      e. Testing firm will take cylinders, perform slump and air entrainment tests in accordance with ACI 301.

B. Testing Firm may, at Owner's discretion, obtain random core samples to confirm compliance with minimum thickness tolerance.

C. Testing Firm will be responsible for documentation of problems and implemented solutions. Information shall be submitted to Owner for inclusion into Record Drawings, which will be submitted to Owner's Maintenance Department for future reference.

D. Testing Firm will be responsible for documenting inspection, including participants, observations, and comments, and will establish second inspection approximately 1 year after original inspection. Second meeting will be mandatory for participants, and is intended to occur within 1-year warranty period. Failure and problem areas will be investigated by participants for determination of failure and responsibility for corrections. Implementation of necessary corrections or repairs and follow-up will be responsibility of Contractor.

E. Testing Firm will be responsible for taking random 3 inch by 5-inch color photographs of paved areas during first and second inspections, and after corrections have been made on observations made during second inspection.

1.09 INCONSISTENCIES:

A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS:

A. Cement: ASTM C150 - Type I Portland type, gray color
B. Fine and Coarse Aggregates: ASTM C33, MDOT 6A
C. Water: Clean and not detrimental to concrete
D. Ground Granulated Blast Furnace Slag (GGBFS) – may be used per Technical recommendations.

2.02 AGGREGATE MATERIALS:

A. Aggregate materials:
   1. Sub-base Course Aggregate:
      a. Sound, angular crushed stone, crushed gravel, or properly cured, crushed blast furnace slag, complying with ASTM D 692 and Section 3.01 of MDOT Standard Specifications, latest edition.
      b. Provide Type 21A or 22A aggregate.
      c. Coordinate with additional requirements of MDOT profiles
      d. Compact to 95% maximum dry density – typical
   2. Base or leveling Fine Aggregate:
      a. Sharp-edged natural sand, 2NS or Class II, or sand prepared from stone, properly cured blast furnace slag, gravel, or combinations thereof, complying with ASTM D-2940.
      b. Coordinate with additional requirements of MDOT profiles
      c. Compact to 95% maximum dry density – typical

2.03 CONCRETE MIX MATERIAL AND INSTALLATION:

A. General:
   1. Mix concrete in field according to ASTM C94.
   2. Add air-entraining admixture at manufacturer's prescribed rate to achieve an air content of 5 to 7% at placement for all exterior concrete – unless noted otherwise.
   3. Prepare Design Mixes according to ACI 301 for each type and strength of concrete required.
   4. Typical slump shall be 2-4 inches for walks and drives
   5. Typical slump for curb and gutter shall be 0-3 inches.

B. Concrete mixture for driveways, private roads and private parking lots shall have the following characteristics:
   1. Meet MDOT designated grade 35P
   2. 3500 psi 28-day compressive strength – unless noted otherwise
   3. Provide welded wire mesh reinforcement unless noted otherwise.
   4. Slump limit – 3 inches
   5. Min. 6" thickness of non-reinforced concrete on 6" base of Class II granular material or 22A dense graded aggregate
   6. Maximum aggregate size – 1.5 inches

C. Concrete mixture for curbs and gutters shall have the following characteristics:
   1. Meet MDOT designated grade 35S
   2. 3500 psi 28-day compressive strength – unless noted otherwise
   3. Slump limit – 0-3 inches

D. Concrete mixture for sidewalks, flatwork, stairs and platforms shall have the following characteristics:
   1. 3000 psi 28-day compressive strength – unless noted otherwise
   2. Provide welded wire mesh reinforcement – typical, unless noted otherwise.
   3. Stairs shall have dimensions and additional steel reinforcing, as noted on the Documents, and have slip-rods installed between stair assemblies and flatwork as indicated.
   4. Min. 5" thickness of concrete on 4" min. base of Class II granular material or 22A dense graded aggregate, or as noted in the Documents.

E. Use set-retarding admixtures during hot weather only when approved by Testing Laboratory.

2.04 FORM MATERIALS:

A. Use steel-form materials typically; MDO plywood (with grain pattern) - to suit conditions.
B. Use flexible or curved forms as required

2.05 STEEL REINFORCEMENT:

A. Reinforcing Steel:
   1. Typical reinforcing steel:
      a. ASTM A615

b. 60 ksi yield grade (grade 420)
c. Deformed billet steel bars, uncoated finish
2. Epoxy-coated reinforcing steel:
a. ASTM A 775
b. 60 ksi yield grade (grade 420) deformed bars
3. Typical joint dowel bars:
a. Plain steel bars, ASTM A 615A
b. 60 ksi yield grade (grade 420)
c. Cut to length as required
4. Epoxy-coated joint dowel bars:
a. ASTM A 775A
b. 60 ksi yield grade (grade 420)

B. Welded Steel Wire Fabric:
1. Plain type, ANSI/ASTM A185
2. Flat sheets or coiled rolls, uncoated finish
3. Bar supports, chairs, spacers and other devices as required per CRSI's "Manual of Standard Practice" for cast-in-place concrete.

C. Tie Wire:
1. Annealed steel, minimum 16 gauge

D. Hook Bolts:
1. ASTM A 615A
2. 60 ksi yield grade (grade 420)

2.06 ACCESSORIES:

A. Curing Compound: Meeting ASTM C309, Type 1, Class B vehicle; Clear waterborne, membrane curing compound.
B. Absorptive Cover: Class 2 burlap cloth weighting approximately 9 oz./sq. yd.
C. Expansion/isolation/construction Joint Filler Strips:
1. Meeting ASTM D 1751 – asphalt-saturated fiber
2. ¾" typical or 1" as specified up against a building structure, non-extruding, pre-molded, continuous strip.

D. Polyurethane (to fill vertical joints): Two component, non-sag and non-staining to meet ASTM C920 and Federal Specification TT-5-002278.
E. Concrete Bumpers:
1. Cement: ASTM C150, Portland Type 1 - Normal; white color. Concrete Materials: ASTM C33; water and sand. Reinforced Steel: ASTM A615, deformed steel bars; unfinished, strength and size commensurate with precast unit design.
2. Air Entrainment Admixture: ASTM C260
3. Concrete Mix: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent.
4. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture.
5. Embed reinforced steel, and drill or sleeve for two dowels.
6. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
7. Normal Size: 6 inches high, 6 inches wide, 6 feet long
8. Normal concrete color

F. Joint, Filler Material for Traffic and Vertical Joints: Closed cell polyethylene joint filler foam backer rod complying with ASTM D1622.
G. Tactile Warning Strips:
1. Provide a tactile warning mat, embedded in concrete pour where required by ADA, for all Barrier-Free sidewalk ramps and other similar approaches that are associated with an accessible pathway. Refer to Documents for additional information.
2. At pedestrian ramps to traffic or hazardous areas provide a warning strip at least 36" long x 12" or 24" width, or as required by ADA.
3. Material Criteria:
a. Tensile strength shall be not less than 15,000 PSI.

b. Flexural strength shall be not less than 25,000 PSI.
c. Panel shall be resistant to stain when tested by ASTM D 543-95.
d. The panel shall be replaceable in so much that it can be removed and reinstalled with removal of surround material.
e. Panel colors shall be as required by ADA, State or local restrictions, and/or as noted herein.

4. Manufactured by:
a. Armor-Tile by Engineered Plastics Inc.
b. ADA Solutions
c. Wausau Tile
d. or equal

H. Lane Marking Paint:
1. Latex, waterborne emulsion, lead and chromate free, ready mix, complying with FS TT-P-1952. Color shall be:
a. Lines shall be 4" wide typically
b. Color: White stripes typical parking bays.
c. Color: Blue stripes at Barrier Free markings.
d. Parking areas will be completed with standard white stripes with blue striping for handicapped spaces, where shown.

2.07 ADMIXTURES:
A. Air Entrainment:
1. ASTM C260
2. Add per manufacturer's recommendations to achieve 5 to 7% at time of placement for all exterior work – unless otherwise noted.
B. Chemical Admixture:
1. ASTM C494
2. Type B and D only; Type B - Retarding, Type D - Water reducing and retarding

PART 3 - EXECUTION

3.01 MAINTAINING TRAFFIC, PUBLIC CONVENIENCE, AND SAFETY:
A. Convenience and access:
1. Conduct work at times to ensure least possible obstruction to existing traffic and inconvenience to general public and residents in vicinity of work, and to ensure access of persons to abutting properties in manner approved by Engineer. No road or street shall be closed to public except with permission of Engineer and proper government authorities. Emergency vehicles shall have access at times, and shall be assisted by Contractor, if necessary. Near end of day's work, Contractor shall remove obstructions, which would make access difficult or impossible.
2. Confer with, and keep, police and fire departments of municipality fully informed as to streets, which are to be closed to traffic for construction purposes. Fire hydrants on or adjacent to work shall be kept accessible to fire fighting equipment at all times.
3. Temporary provisions shall be made to ensure proper functioning of gutters, sewer inlets, and drainage ditches.
B. Lights, signs, and barricades:
1. Provide adequate warning signs, barricades, lights, and flaggers, and take necessary precautions for protection of work and safety of workers and of general public. Streets, roads, highways, alleys, and other areas accessible to public, which are closed to traffic, shall be protected by means of effective barricades on which shall be placed approved warning signs.
2. Open trenches and other excavations shall be provided with suitable barriers, signs, and lights to extent that adequate protection is provided to public against accident by reasons of such open construction. Obstructions, such as material piles and equipment, shall be provided with similar warning signs and lights.

3. Barricades, signs, lights, and other protective devices shall be installed and maintained in conformity with applicable statutory requirements, and where within railroad and highway rights-of-way, as required by authority having jurisdiction.

C. Dust control:
1. Keep paved surfaces and access routes cleaned and free of debris, and control dust from construction operations by application of water, salt, chloride or by other approved means. If Contractor fails to correct unsatisfactory conditions promptly after due notification, Engineer will arrange for work to be performed by other means, and will deduct cost thereof from monies that are due or may become due to Contractor.

3.02 PAVEMENT SUBBASE COURSE:

A. Preparation:
1. The subgrade shall be smoothed, compacted and trimmed to the required line, grade and cross section to receive the aggregate sub-base material.

B. Placing:
1. Placing sub-base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting sub-base materials during placement operations.
2. When a compacted sub-base course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

C. Grading:
1. Grade and fine grade to required line, grade and cross section. Surface shall be smooth and dense. Maintain optimum moisture content during grading operations.

D. Compaction:
1. Compact each layer to not less than 98% of Maximum Unit Weight per AASHTO T-180 test.

E. Grade Control:
1. During construction, maintain lines and grades, including crown and cross-slope of sub-base course.
2. Maintain min. of 1/8” per foot positive slope to drain.
3. Should aggregate sub-base be damaged, Contractor shall restore sub-base to a smooth, compacted condition at no additional cost to the Owner.

3.03 FIELD ENGINEERING REGARDING PLACEMENT OF CONCRETE:

A. It is this Contractor’s responsibility to verify appropriate grades, slopes and tolerances and address any code non-conformity prior to casting concrete.

B. Verify compacted subgrade is ready to support paving and imposed loads

C. Place concrete in accordance with ACI 301

D. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

E. Comply with tolerances of ACI 117 and as follows:
1. elevation tolerance: ¼”
2. thickness: plus 3/8”
3. surface variations: gap below a 10-foot-long straight edge not to exceed ¼”

F. For surfaces required to meet ADA requirements:
1. maximum cross slope for walks, ramps and platforms – less than 2%
2. maximum longitudinal walk slope not requiring landing and handrails – 5%
3. **maximum longitudinal ramp slope with hand/guardrails – 8.33% (1 : 12)**

G. Coordinate location of all required tactile warning mats with ADA requirements and install during concrete pour.
1. Panels shall be cut to fit site restriction as required.
2. All panels shall be installed per manufacturer’s requirements.
3. It is the responsibility of this contractor to coordinate and install all panels as required by jurisdiction, and if not so installed – the contractor shall remove the panel and associated section of flatwork and re-install both

H. Beginning of installation means acceptance of existing conditions

3.04 REINFORCEMENT:

A. Place reinforcement as detailed, or as noted on plans.
B. Interrupt reinforcement at expansion joints.
C. Conform to CRSI's "Manual of Standard Practice" for fabricating and "Placing Reinforcing Bars" for placing and supporting.

3.05 FORMED JOINTS FOR SIDEWALKS AND FLATWORK:

A. Typical contraction/control joints at 5 foot on center as typical spacing, or as indicated on the drawings.
   1. **Place contraction and control joints in the EXACT location if shown on the drawings. If a conflict in patterns occurs, coordinate with Architect in the field.**
   2. Form ¼" wide joint for a depth equal to at least one-third of the concrete thickness.
   3. Grooved joints: form contraction joints after initial floating by grooving and finishing. Tool to a 3/8" radius. Eliminate groove marks.
   4. Sawed joints allowed only at the direction of the Architect/Engineer: Form with a power saw. Cut 1/8" wide joints into concrete when cutting will not tear or otherwise damage concrete surface, and before random cracking may occur.
B. **Place isolation/expansion joints as indicated or as noted below:**
   1. Typical expansion joints at 40 maximum spacing if not indicated on Documents.
   2. Install joint at intersection of slabs that occurs at angles to one-another.
   3. Joints shall be full depth of pavement
   4. **Place 3/4" isolation joint filler between paving components and building or other appurtenances.** Fill recess with polyurethane sealant between flatwork and building or other structure.
   5. Recess top of filler 1/2 inch
C. Install dowel bars and support assemblies at joints if indicated in documents. Set with one-half with asphalt coating or lubricant to prevent concrete bond on one half.

3.06 FORMED JOINTS FOR DRIVES, APPROACHES AND PARKING AREAS:

A. Typical construction/expansion joints:
   1. ¾" expansion material shall extend to the full depth of the slab.
   2. the top of the material shall not be above the concrete nor more than ½" below top surface
   3. install at abutting pavement, each side of all driveways and elsewhere at 300 foot maximum intervals
B. Typical Control Joints shall be placed to divide the slab into uniform sections (unless detailed otherwise) normally between eight and ten feet in length.
C. Install joint at intersection of slabs that occurs at angles to one-another.
D. Joints shall be formed by a divide 1/8" thick and typically 3" deep into the surface of the slab or curb.

3.07 FINISHING:

A. Walks: Light broom, perpendicular to traffic use. See Documents for additional patterns that may occur.
B. Curbs and Gutters: Light broom, parallel to line of flow
C. Inclined ramps: heavy, broomed perpendicular to slope
D. Place clear curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions. Apply at minimum rate of one gallon per 200 square feet.
E. Edging: tool perimeter edges of pavement, curbs and gutter, etc. after initial floating with a 3/8" radiused tool. Remove all tool marks, broom to final appearance.
F. Coordinate with ADA requirements of detectable warning surfaces and inform Architect of conflicts prior to install and finishing.

3.08 FIELD QUALITY CONTROL:

A. Field inspection and testing will be performed by Testing Laboratory.
B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature and test samples taken.
C. Provide compressive test specimens per ASTM C 31.
D. Test per ASTM C39 for compressive-strength. Create a test sample for each pour and test for 7 and 28 day tests.

3.09 CONCRETE PROTECTION AND CURING:

A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.
B. Apply evaporation retarder to concrete surfaces if hot, dry or windy conditions may cause moisture loss approaching 0.2 lb/sf/h before and during finishing.
C. Moisture Curing - Keep surfaces continuously moist for not less than seven days with any of the following applications;
   1. Water
   2. continuous water-fog spray
   3. absorptive cover – water saturated
D. Fresh concrete shall be guarded until surface has cured. Concrete panels which are vandalized, stepped in, or damaged in any way shall be replaced at the Contractor's expense.

3.10 TRAFFIC AND LANE MARKINGS:

A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
B. Pavement Striping: Use latex base, traffic lane-marking paint, factory-mixed, quick-drying, and non-bleeding.
C. Allow paving to age for 30 days before starting pavement marking.
D. Traffic and lane markers shall be a 4" wide stripe painted white.
E. Do not apply traffic and lane marking paint until layout and placement have been verified with Architect/Engineer.
F. Apply paint with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates to provide minimum 12 to 15 mils dry thickness.
G. Coordinate and install parking bumpers with all traffic and parking bay markings – as indicated on documents or as required.

3.11 SCHEDULE – UNLESS NOTED OTHERWISE ON THE DOCUMENTS:

A. Sidewalks:
   1. 5" min. of non-reinforced, concrete paving
   2. 4" min. of fine aggregate or Class II sand fill/leveling course
B. Sidewalks and flatwork within drive approaches:
   1. 6" min. of reinforced concrete paving
   2. On 6" min. of fine aggregate or Class II fill/leveling course
C. Stair system:
   1. 5" min. of reinforced concrete paving
   2. Base course of 6" min. 21AA or other aggregate to allow placement on sloped surface and provide 95% compaction
   3. Additional fine aggregate or Class II sand fill/leveling course as required
   4. Coordinate expansion/controls joints for special patterns that may occur.

END OF SECTION 02514

SECTION 02830 - CHAIN LINK FENCING – as Reference for re-installation of Fencing

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification sections, apply to the work of this Section.

1.02 DESCRIPTION OF WORK:
- A. Furnishing and installing all labor, materials and equipment necessary for a complete installation of chain link fencing and accessories as shown on the Drawings and specified herein.
- B. Type of work included:
  1. Installation of new galvanized chain link fencing system and accessories.
  2. Relocation and reinstallation of existing fencing system, including gate as required by the Documents.
  3. Locating and setting all concrete for post bases.
- C. Coordinate with work of other sections and trades as required.

1.03 RELATED WORK SPECIFIED ELSEWHERE:
- A. Section 02514 - Portland Cement Concrete Paving
- B. Section 02936 – Fine Grading and Grasses
- C. Section 03300 - Concrete Work

1.04 REFERENCES:
- A. ASTM A123 – zinc (hot galvanized) coating of products from rolled, pressed and forged steel shapes.
- B. ASTM F 567 – Installation of chain-link fence
- C. ASTM A 120 – pipe, steel, black and hot-dipped, zinc-coated welded and seamless material.
- D. ASTM A 392 – zinc-coated steel chain-line fence fabric.

1.05 QUALITY ASSURANCE:
- A. Manufacturer: Provide products from a single manufacturer having a minimum of five (5) years documented experience manufacturing PVC-coated chain link fencing systems and gates.
- B. Installer: Installation company and crew shall have a minimum of three (3) years documented experience specializing in fence installation and on projects comparable in scope and type to the work of this section.

1.06 SUBMITTALS:
- A. Product Data: Submit manufacturer's technical product data for PVC-coated chain link fencing system and accessories indicating material compliance and specified options.
- B. Shop Drawings: Submit shop drawings showing layout of fencing and gates with dimensions, details and finishes of components, accessories and post foundations. Shop drawings shall also indicate work to be done involving existing fence framing and reinstallation of existing salvaged fencing.
  1. Work of this section shall not commence until the Architect has returned approved shop drawings to the Contractor.
- C. Samples: Submit color samples of specified color. Provide samples of materials (e.g. fabric, wires and other accessories) if Architect so requests.

1.07 WARRANTY:
- A. The work of this section shall be warranted against defective materials and workmanship as follows:

1. Labor: one (1) year.
2. Fabric: fifteen (15) years.
3. Framework: ten (10) years.

B. Warranties shall take effect from the date of final inspection and acceptance of the work by the Owner. All limited warranties on material shall be extended from the installer to the Owner in writing prior to the final payment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Acceptable Manufacturers: Subject to compliance with requirements, provide chain link fabric and fencing accessories by one of the following:
   1. American Fence Corp
   2. Anchor Fence, Inc.
   3. Or Architect approved substitution under provisions of Section 01600.

2.02 GALVANIZED CHAIN LINK FENCE FABRIC:

A. Provide fabric in one-piece widths for fencing in heights of 12 and less.
   1. Mesh and Wire size: No. 9 ga., steel wire, 2-inc mesh, 0.148-inch diameter.
   2. Fabric Finish: Galvanized, ASTM A392, Class LL, with not less than 2.0 oz. zinc per SF of surface.
   3. Coat selvage ends of fabric that is metallic coated during the weaving process with manufacturer's standard clear protective coating.
   4. Selvage: knuckled at both selvages.

2.03 STEEL FENCE FRAMING:

A. Fence framing consists of all line, corner, terminal posts, horizontal rails and gate frame materials.
   1. Arrangement of posts and rails shall match existing fencing system, unless otherwise indicated.

B. Steel Pipe, Type I: ASTM F1083 and A569; minimum yield strength of 25,000 psi. Pipe shall be standard outside dimension (O.D.) Class 1, Grade A, hot-dipped galvanized schedule 40 steel with a minimum of two (2) ounces of zinc per square foot or AS-40 steel tubing.

C. Steel Framing Components Size & Weight, unless otherwise noted:

	Size (O.D.)	Sch. 40 Weight	Wall Thickness
Line Posts @ 6'-0" or less:	2 inches	2.72 lbs.	0.145 inches
Line Posts over 6'-0":	2-1/2 inches	3.65 lbs.	0.154 inches
Terminal, Corner & Pull Posts:	3 inches	5.79 lbs.	0.203 inches
Rails & Braces	1-5/8 inches	2.27 lbs.	0.140 inches

2.04 FITTINGS AND ACCESSORIES:

A. Chain Link Fence Accessories: ASTM F626. Provide all accessory items to complete fence system. All ferrous metal items to be galvanized. All fixed component parts such as post tops, bands, connectors and rail ends shall be PVC coated on visible surfaces to match fence fabric and framing. Non-visible portions of aluminum parts may be uncoated. Non-visible portions of steel or iron parts not PVC coated must be zinc coated in accordance with ASTM A153. All threaded posts shall be coated in the field with a PVC base compound after installation.

B. Post Caps: Formed steel, cast malleable iron or cast aluminum alloy; weather tight fit and designed so as to positively exclude all moisture from the posts. Supply cone type caps for terminal posts and loop type for line posts.
C. Rail and Brace Ends: Formed steel or cast malleable iron; cup-shaped to receive rail and brace ends. For connection of rail and brace to terminal posts.
D. Top Rail Sleeves: Tubular steel; 0.051 thickness; minimum 6 inches long; expansion type.
E. Wire Ties: 9 ga. hot-dipped, galvanized steel wire; for attachment of fabric to line posts. Double wrap 13 ga. for rails and braces. Hog ring ties of 12 ga. for attachment of fabric to tension wire.
F. Brace and Tension (Stretcher Bar) Bands: Hot-dipped galvanized, cold-rolled, carbon steel, 3/4" wide. 14 ga. steel for tension bands. 12 ga. steel for brace bands. Secure with 5/16" diameter, galvanized carriage bolts.
G. Tension (Stretcher) Bars: Hot-dipped galvanized, cold-rolled, carbon steel strip. One piece lengths equal to 2 inches less than full height of fabric with a minimum cross section of 3/16" x 3/4". Provide one tension bar for each terminal and gate post, and two for each corner post.
H. Tension Wire: 7 ga. metallic coated steel wire; tensile strength of 75,000 psi.
I. Truss Rods: Hot-dip galvanized steel or mill finished aluminum rods, merchant quality with turnbuckle; minimum 5/16" diameter.

2.05 SETTING MATERIALS:
A. Concrete fill at all posts: Minimum 28-day compressive strength of 3,000 psi.

PART 3 - EXECUTION

3.01 EXAMINATION:
A. Verify areas to receive fencing are completed to final grades and elevations.
B. Ensure property lines and legal boundaries of work are clearly established.

3.02 CHAIN LINK FENCE & GATE FRAMING INSTALLATION:
A. Install chain link fence and gate system in accordance with ASTM F567 and manufacturer's instructions.
1. Prepare materials and components of existing fencing removed for relocation as required for reinstallation. Standard of installation for existing fencing system shall meet that for new fencing system. Replace any damaged or defective existing components with new.
2. Install new and relocated existing fencing system so that there is no more than 3" clearance between:
a. Finish grade and the bottom selvage of fencing mesh.
b. Terminal fence posts and the face of adjacent buildings, walls or other structures.
B. Locate terminal post at each fence termination and at each change in horizontal or vertical direction of 30 degrees or more.
C. Space line posts uniformly and at intervals not exceeding ten (10) feet.
D. Concrete-Set Posts: Terminal, gate and line posts shall be set in cylindrical concrete footings. Footing holes shall have a minimum diameter of 4 times greater than the outside dimension of the post, and a minimum depth of 42 inches below finish grade. Excavate deeper as required to achieve adequate support in soft and loose soils and for posts with heavy lateral loads. Place concrete around posts in a continuous pour. Trowel finish around post. Top of footing to be 2" above grade and sloped to direct water away from posts.
E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations. Confirm heights with those indicated on Drawings.
F. Bracing: Brace terminal and gate posts back to adjacent line posts with horizontal brace rails and diagonal truss rods. Install horizontal pipe brace at mid-height for fences 6 feet and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

G. Tension Wire: Install tension wire before stretching fabric and attach to each post with tie wires. Locate tension wire at bottom of fabric at 4" above grade. Where top rail is omitted, stretch top tension wire within the top 6" of the fabric.
H. Top Rail: Install through line post loop caps; 21-foot lengths. Connect joints with sleeves to create a continuous rail between terminal posts and for rigid connections with expansion/contraction capacity.
I. Bottom Rail: Install bottom rails between posts with required fittings and accessories.

3.04 CHAIN LINK FABRIC INSTALLATION:

A. Fabric: Install fabric on security (or "outside") side, and attach so that fabric remains in tension after pulling force is released. Leave no more than 3" between finish grade and bottom selvage. Attach fabric to framework as follows:
   1. @ Line Posts: Attach with wire ties at 12" o.c. maximum.
   2. @ Top & Bottom Rails: Attach with wire ties at 24" o.c. maximum.
   3. @ Tension Wires: Attach with hog rings at 24" o.c. maximum.
B. Tension (Stretcher) Bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with tension bands spaced at 15" o.c. maximum.
C. Match detail of existing installation whenever possible.

3.05 ACCESSORY INSTALLATION:

A. Tie Wires: Bend ends of wire to minimize hazard to persons and clothing.
B. Fasteners: Install nuts for fittings, bands and hardware bolts on side of fence opposite fabric side for added security.

3.06 ADJUSTING AND CLEAN-UP:

A. Clean up debris and unused material, and remove from site. Area of installation shall be left free of debris caused by installation of fencing system.
B. Adjust gate to operate smoothly, and quietly, free from binding, warp and distortion.
C. Confirm that latches and locks engage accurately and securely without forcing of binding.
D. Lubricate all moving parts with an appropriate lubricant for the particular metal.

END OF SECTION 02830

SECTION 02936 - FINE GRADING AND GRASSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 WORK INCLUDED:

A. Provide all fine grading and grasses where shown on Drawings, as specified herein and as necessary for a complete and proper installation.
B. Work shall include but not be limited to:
   1. Subgrade preparation for all areas to be seeded and/or sodded
   2. Providing new topsoil
   3. Replacing topsoil and fine grading for all areas to be seeded and/or sodded.
   4. Furnishing and application of soil amendments
   5. **Sod placement and/or Lawn seeding** and fertilizing
   6. Lawn establishment
C. Work may include coordination of mulch beds or other plantings specified elsewhere.
D. Providing and setting lawn and planting bed edging.
E. Guarantee of Planting material

1.03 RELATED SECTIONS:

A. Section 01400 Quality Control and Testing Laboratory Services: Testing fill compaction.
B. Section 02110: Site Preparation
C. Section 02200: Earthwork
D. Section 02218: Finish Grading
E. Section 02513 & 02514 – Asphalt and concrete paving

1.04 QUALITY ASSURANCES:

A. Soil amendments: Copies of invoices shall be provided to the Architect. Samples must be provided if requested by the Architect.
B. Seed: Provide the Architect with manufacturer's certification of compliance to the Specifications prior to seeding.
C. Analyze topsoil to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

1.05 SUBMITTALS:

A. Certification:
   1. Submit Certificates of Inspection as required by governmental authorities, and manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
B. Maintenance Instructions:
   1. Submit typewritten instructions recommending procedures to be established by owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period(s).

1.06 DEFINITIONS

A. Definition of Period for lawn and plant material: The First Maintenance and Guarantee Period begins the spring following planting and continues until the end of that growing season. The Second Maintenance and Guarantee Period is the following growing season. A growing season is defined as the beginning of May through mid- November. If planting is not

completed prior to the end of May, the First Maintenance and Guarantee Period includes the remainder of that growing season plus the next growing season.

1.07 ACCEPTANCE OF INSTALLATION

A. At the completion of all landscape installation the Landscape Contractor shall request an inspection for acceptance of installation. The Architect/Owner shall inspect the project and issue a written statement of acceptance of installation and establish the beginning of the project warranty period.
B. It is the responsibility of the Landscape Contractor to make the above request which will be followed by the inspection – all of which will initiate the Warranty Period.

1.08 WARRANTY:

A. Warranty grasses and sodded areas for a period of one year after date of substantial completion, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Installer's control.

1.09 SCHEDULE

A. Schedule: A minimum of one visit is required for each of the following time periods during the First and Second Maintenance and Guarantee periods.
   1. 1 June to 15 June
   3. 15 July to 29 July
   5. 5 September to 19 September
   6. 1 November to 15 November
B. Verification of visits may be required by the OWNER in the form of reports and/or certified payroll covering visits.

PART 2 - PRODUCTS

2.01 TOPSOIL:

A. Existing topsoil that has been stripped and stockpiled shall be re-spread on the finished subgrade. It shall be free of any admixture of subsoil, stones larger than one (1) inch, clods of hard earth, plants or roots, sticks, concrete, asphalt, or other extraneous material. It shall contain no toxic materials.
B. If quantity of stockpiled topsoil is insufficient to provide minimum depth of 4" for lawn areas and 6” for planting beds when re-spread and fine graded, provide new topsoil which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2" in any dimension, and other extraneous or toxic matter harmful to plant growth.
   1. Shall meet ASTM D 5268, pH range of 5.5 to 7 and have a minimum of 4% organic material content.
   2. Import topsoil or manufactured topsoil from off-site sources if required.

2.02 SOIL AMENDMENTS:

A. Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following percentages of available plant nutrients:
   1. For lawn, provide fertilizer with not less than 4% phosphoric acid and not less than 2% potassium, and percentage of nitrogen required to provide not less than 1 lb. of actual nitrogen per 1,000 sq. ft. of lawn area. Provide nitrogen in a form that will be available to lawn during the initial period of growth.
      a. Fertilizer shall be 15-30-15 Super Starter Amturf Custom Blend Fertilizer or Architect approved substitution under provisions of Section 01600.
      b. Comply with the requirements of the City of Ann Arbor for fertilizer chemistry that does not allow phosphorus content to be used in the City.

B. Inorganic Soil Amendments:
   1. Lime: ASTM C 602, agricultural limestone containing a min. 80% calcium carbonate equivalent.
   2. Iron Sulfate: Granulated ferrous sulfate containing a min. of 20% iron and 10% sulfur.
   3. Perlite: Horticultural perlite, soil amendment grade.
   4. Sand: Clean, washed, natural – free of toxic materials.

C. Organic Soil Amendments:
   1. Compost: organic matter – 60% of dry weight
   2. Peat: Finely divided or granular texture with a pH range of 6 to 7.5, containing decomposed moss peat, native peat, or reed-sedge peat.
   3. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25% by volume of straw, sawdust or other bedding materials; free of toxic substances, stones, etc.

D. For sodding areas:
   1. Herbicides: A pre-emergent week killer such as "Banlon" or approved equal. Select herbicide in accordance with sod supplier's recommendations. Applied to areas with sod only.
   2. Wood Pegs: Softwood, 1" x 1" or 1" x 2", 10" minimum length.

E. Comply with the requirements of the City of Ann Arbor for fertilizer chemistry that does not allow phosphorus content to be used in the City.

2.03 SOD:

A. MDOT designated Class "A" sod, grown on mineral soil with strong fibrous root system, machine-stripped not more than 24 hours prior to laying.

B. **Turfgrass species**:
   1. Full Sun: Kentucky Bluegrass (Poa Pratensis), a minimum of 3 cultivars.
   2. Grass specie shall have not less than 95% germination, not less than 85% pure seed, and not more than 0.5% weed seed.

C. Sod shall be free from disease, insect, pests, weeds, other grasses, stones, and any other harmful or deleterious matter.

D. Sod shall be two (2) years old machine cut, rolled or folded.

E. Sod shall have a uniform soil thickness of approximately one inch (1"). Measurement for thickness shall exclude top growth and thatch.

F. Sod shall be in strips of uniform width, not less than 10 inches, lengths of not less than 18 inches and an area of not less than one-half (1/2") square yard.

G. Sod grown on peat will not be accepted.

H. Weed content shall not be over a 0.30 of 1%.

2.04 SEED: -

A. Open Lawn seed shall be fresh, clean, new-crop seed composed of varieties, mixed in proportions and tested for minimum percentages of purity and germination as follows:

Variety	Proportion	Purity	Germination
Newport Kentucky Blue Grass	40%	95%	80%
Wrangler Turf type Tall Fescue	40%	95%	80%
Allaire II Perennial Rye	20%	95%	80%

   1. Supplied by Turfgrass – 248-437-1427
   2. Spread at a rate of 6-7 lbs./1000 SF.

2.05 MISCELLANEOUS LANDSCAPE MATERIALS:

A. Weed Block:
   1. Non-woven fabric placed below mulch to prevent weeds from rooting.
   2. Cross-cut an opening in fabric for each planting individually to assure integrity from weed between plantings.

B. Erosion-Control Mesh: Biodegradable, twisted jute or spun-coir mesh. A min. of 0.92 lb./SY with 50 to 60 % open area.
C. Steel Edging:
   1. Shall be 1/8" thick x 4" high x 10 to 12 foot lengths
   2. Provide anchor point at 30" intervals with 10 ga. x 12" length min. coated steel stakes.
   3. Weight (including stakes) per 16-foot section shall be approx. 36 pounds.
   4. Edging shall be as manufactured by:
      a. Ryerson Steel
      b. Col-met Metal Specialties
      c. or approved equal.
   5. All steel edging shall be painted with two coats flat black rust inhibitive paint, "Rustoleum" or approved equal, prior to installation.
   6. Provide accessories as required for a complete installation:
      a. Corner stakes
      b. End section with down-turned shape
      c. Tree-ring sections

2.06 MULCH AND TOP DRESSINGS:
A. Material shall be straw. It shall be natural and suited for horticultural use and not contain lumps, roots or other foreign matter over one inch in diameter. It shall be free from noxious weeds. Mulch shall not contain more than 35% moisture by weight.
B. Shredded bark mulch shall be processed shredded hardwood bark, free of leaves, twigs or other extraneous materials.
C. Peat mulch shall be granulated raw peat moss or baled peat moss, containing not more than 9% mineral on a dry basis, Canadian peat.

2.07 WATER:
A. Source: If not available on site, shall be provided by the Contractor.
B. Quality: Water supplied by the Contractor shall be free of harmful substances.

PART 3 - EXECUTION

3.01 EXAMINATION:
A. Verify building and trench backfilling have been inspected.
B. Verify substrate base has been contoured and compacted.
C. Acceptance of final grade and subsequent installation of grasses initiates warranty responsibility for grasses and final grades by this contractor.

3.02 SUBGRADE PREPARATION:
A. Scarify subgrade immediately prior to placing topsoil to a minimum depth of four (4) inches. Scarified lines shall be perpendicular to slopes.
B. Remove stones over 3/4 in any dimension and sticks, roots, rubbish and other extraneous matter.
C. Any lumps or depressions that occur shall be re-graded and rerolled until a satisfactory grade is obtained.
D. Areas may be machine-finished provided:
   1. That a smooth finely pulverized seedbed is produced.
   2. That machinery and method of operations are approved and in accordance with sod supplier's recommendations.
E. Hand rake three-foot (3') strip adjacent to paving or structures.

3.03 PLACING TOPSOIL:

A. Place topsoil, as required, on subgrade to a settled depth of not less than six (6) inches so that finish surface is a fine, pulverized seed bed, varying not more than one (1) inch in ten (10) feet.
B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
C. Remove roots, weeds, rocks, and foreign material while spreading.
D. Manually spread topsoil close to plant life to prevent damage.
E. Lightly compact placed topsoil.
F. Remove surplus subsoil and topsoil from site.
G. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 TOLERANCES:
A. Top of Topsoil: Plus or minus ½ inch.

3.05 SODDING:
A. Moisten prepared surface immediately prior to laying sod; do not create muddy soil conditions.
B. Lay sod within 24 hours after harvesting to prevent deterioration.
C. Lay sod parallel to the direction of the slope and tight with no open joints visible and no overlapping; stagger end joints eight inches (8") minimum. Do not stretch or overlap sod pieces.
D. On slopes steeper than three feet (3') horizontal to one foot (1'), vertical (3:1) lay sod perpendicular to slope and secure every row with wooden pegs at maximum two feet (2') on center. Drive pegs flush with soil portion of sod.
E. Water sodded areas immediately after installation with a fine spray.
F. Water the lawn until final acceptance to prevent grass and soil from drying out.
G. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions and sod supplier's recommendations. Remedy damage resulting from the improper use of herbicides.
H. Protection of newly sodded areas is the responsibility of the Contractor. Provide and maintain safety fencing around newly sodded areas at no additional cost to Owner until turf can support foot traffic.

3.06 SEED ESTABLISHMENT:
A. Seeding New Lawns:
1. All areas to be seeded shall be covered with 4" of good topsoil before placing seed.
2. The topsoil shall be raked to even surfaces, and all stones, sticks and debris shall be removed. Roll topsoil with empty roller, rake up rolled topsoil surface.
3. Sow seed during the months of **April**/**May** or **August**/**September**, unless otherwise approved by the Architect. Do not sow seed when weather conditions are unfavorable, such as during drought or high winds.
4. Sow seed evenly at the rate of 4 pounds per 1,000 square feet minimum (or as specified herein for particular varieties) using a cultipacker seeder such as Lawn-maker, Brillion or as approved.
5. Areas shall be seeded in at least two directions. Turfgrass seeds shall not be covered by more than 1/4" of soil.

B. Hydroseeding – **optional method**:
1. Use a hydromulcher and apply mixture(s) at the following rate – in accordance with manufacturer's recommendations:

Seed:	At specified seeding rates (300 #/Acre)
Fertilizer:	400 #/Acre
Tackifier:	60 gallons/Acre
Wood Cellulose Fiber Mulch	2000#/ Acre

C. Water thoroughly and immediately with a fine mist until soil is soaked to a depth of 2 inches. Maintain soil in a moist condition until seeds have sprouted and reached a height of one inch. Water thereafter at least once every 7 days unless natural rainfall has provided equivalent watering.
D. Fertilize during operation at the rate of 50 pounds per 15,000 square feet.
E. Sowing the seed using a mechanical seeder such as a lawn maker or brillion may be used at the Contractor's option and expense if he/she feels it is in the best interest of lawn establishment.
   1. A cultipacker or approved similar equipment may be used to cover the seed and form the seed bed in one operation.
   2. Lines of seed shall be perpendicular to slopes to reduce rapid surface water run-off. If this option is chosen fertilize prior to seeding operations.
   3. Thoroughly incorporate fertilizer into topsoil to a depth of two inches.
   4. Immediately before sowing lawn seed, Contractor shall rework the surface until it is a fine, pulverized seed bed, varying not more than one (1) inch in ten (10) feet.

3.07 LAWN ESTABLISHMENT AND ACCEPTANCE:

A. Establishment of a dense lawn of permanent grasses, free from mounds and depressions is the responsibility of the Contractor. Any part of the area that fails to show a uniform germination shall be reseeded and such reseeding shall continue until a dense lawn is established.
B. Irrigation: The Contractor shall keep seeded areas moist for optimum plant growth until the grass is three inches high.
C. Initial mowing of the lawn area shall take place when grass is four (4) inches high and shall be the responsibility of the Contractor. Cutting height shall be three (3) inches minimum.
D. Erosion damage shall be repaired by the Contractor.
E. Bare spots over three (3) percent of the area nor greater than one square foot in size will be allowed.
F. Protection of newly seeded areas is the responsibility of the Contractor. As the Contractor determines necessary to establish seed, safety fence may be installed at no additional cost to the Owner.
G. An approved sod may be used at the Contractor's option and expense if he/she feels it is in the best interest of lawn establishment.
H. Acceptance will be when all the above requirements have been met.

3.08 MAINTENANCE OF SEEDED AND SODDED AREAS:

A. Water seed and sodded areas thoroughly as required to establish proper rooting
B. The Contractor shall establish a dense lawn of permanent grasses. Repair, rework and re-seed or sod all areas that have washed out or are eroded.
C. Mow lawn areas as soon as lawn reaches a 3" height.
D. The Contractor shall provide a minimum of two cuttings until acceptance of installation by the Owner. The Owner assumes cutting responsibility following the final acceptance of installation.
E. If seeded in Fall, or if not considered acceptable at that time, continue maintenance the following Spring until acceptable lawn is established.
F. After acceptance of installation, and for the duration of the Project warranty period, the Landscape Contractor shall continue all other maintenance procedures including:
   1. Fertilizing and weeding
   2. regrading, replanting and applying insecticides as required
   3. Applying three applications of fertilizer in seven to eight week intervals
   4. Water as required to keep all plantings in optimum condition (1 inch of total water per week, including rainfall).
G. At the conclusion of the Project warranty period, and after reviewing written final acceptance by the Owner, the Owner shall assume all lawn maintenance responsibilities.

3.09 FERTILIZER APPLICATION AND WEEDING

A. Application shall be according to manufacturer's directions.
B. Top-dress at a rate of 1 pound of nitrogen per 1,000 square feet.
C. Methods: Weeds shall be removed by hand. Before application of any herbicide the CONTRACTOR shall receive approval of the OWNER. A selective herbicide shall be applied according to manufacturer's directions.

3.10 INSPECTION AND ACCEPTANCE:

A. When landscape work is completed, including maintenance, Architect will, upon request, make an inspection to determine acceptability.
B. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Architect and found to be acceptable. Remove rejected plants and materials promptly from project site.

3.06 SCHEDULES:

A. Install loosely tilled topsoil thickness at the following areas:
   1. Seeded Grass: 6 inches
   2. Sod: 4 inches
   3. Shrub Beds: 18 inches
   4. Flower Beds: 12 inches
B. Install loosely piled mulch in noted thickness at the following areas:
   1. Planting beds: 4 inches

END OF SECTION 02936

SECTION 03300 - CONCRETE WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. All Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions, Division 0, and Division 1 Specification sections apply to the Work of this Section.

1.02 DESCRIPTION OF WORK:

A. Extent of concrete work shown on Drawings and specified herein, including but limited to:
   1. Cast-in-place, exterior stairs and haunch
B. Accessories for concrete formwork, installation and reinforcement
C. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete
D. Field finishing of concrete surfaces
E. Formwork for cast-in-place concrete, with shoring, bracing and anchorage
F. Form accessories.
G. Form stripping.

1.03 RELATED SECTIONS:

A. Section 02514 – Portland Cement Concrete Paving

1.04 QUALITY ASSURANCE:

A. Codes and Standards -- Comply with the provisions of latest editions of the following:
   1. ACI 301 "Specifications for Structural Concrete for Buildings"
   2. ACI 302 "Recommended Practice for Concrete Floor and Slab Construction"
   3. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
   4. ACI 308 - Standard Practice for Curing Concrete
   5. ACI 311 "Recommended Practice for Concrete Inspection"
   6. ACI 318 "Building Code Requirements for Reinforced Concrete"
   7. ACI 347 "Recommended Practice for Concrete Formwork"
   8. ASTM C171 - Sheet Materials for Curing Concrete
   9. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete
   10. ACI 303R-91 “Guide to Cast-In-Place Architectural Concrete Practice”
   11. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement
   12. Concrete Reinforcing Steel Institute, "Manual of Standard Practice", except where more stringent requirements are shown or specified
   13. CRSI - Concrete Reinforcing Steel Institute - Manual of Practice
   14. CRSI 63 - Recommended Practice For Placing Reinforcing Bars
B. Concrete Testing Service: The Owner will employ and Contractor will coordinate with a testing laboratory to perform materials evaluation and testing, and to design and test concrete mixes in accord with requirements of ACI 301, and to evaluate and inspect concrete delivered to, and placed at, the site. The Contractor shall have no involvement with the Owner's testing laboratory. The testing laboratory will be entirely responsible for taking, storing, curing, etc., of all concrete samples.
C. Installers: Installation of concrete paving, including any special architectural concrete work, shall be carried out by contractors and their employees who are thoroughly experienced and skilled in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this section.
   1. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.
   2. Design formwork under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Michigan.

3. Installation Company and crew shall have a minimum of five (5) years of documented experience in projects comparable to the work described on the Drawings and specified herein.

D. Preinstallation Conference - Conduct conference at Project site to comply with requirements of Division 1 and the following:
   1. At least 30 days prior to submitting design mixes. Conduct a meeting to review detailed requirements for preparing concrete design mixes.
   2. Establish preliminary work progress schedule and procedures for materials inspection, testing and certifications.

E. Single Materials Source: Obtain each material from same source throughout to ensure consistency of finished work. Provide "system" products from a single manufacturer to ensure compatibility.

F. Where special treatments, admixtures or processes are to be used in architectural concrete work, the Architect shall receive Field Service Reports at regular intervals from the associated manufacturer's representative documenting the progress of the work.

1.05 SUBMITTALS:

A. Concrete Mix Designs

B. Reinforcing Placing Drawings

C. Laboratory Test Reports: The testing agency shall submit 3 copies of laboratory test reports for concrete materials, for mix design tests and for results of field quality control testing to the Architect, the Owner, Contractor and concrete producer on same day tests are made.
   1. Submit proposed mix design to Architect for review prior to commencement of work.

D. Shop Drawings:
   1. Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
   2. Provide scaled, professionally-produced shop drawings (min. 1/4" = 1'-0") showing all concrete profiles
   3. Indicate form tie types and locations, and all joints in concrete (expansion, control, construction
   4. Indicate any other required joints for horizontal or vertical surfaces).
   5. Indicate all dimensions, materials, bracing, and arrangement of all products.

E. Product Data: Submit manufacturer's product data for all products and materials certifying compliance with specified requirements.

1.06 INCONSISTENCIES:

A. In the case that a discrepancy exists between two or more stated or implied characteristics of any product, assembly, technique, and application, etc., between any one or more Sections of this Project Manual, any one or more Paragraphs of this Specification, or between the Drawings and Specifications, the Contractor's Bid amount shall reflect the most costly version or combination of the requirement(s).

PART 2 – PRODUCTS

2.01 CONCRETE MATERIALS:

A. Portland Cement: ASTM C 150, Type I for sub-surface installations; Type IA for flat-work and exposed applications.
   1. Use one brand of cement throughout Project.

B. Normal-weight aggregates: ASTM C 33.
   1. Provide aggregates from a single source for exposed concrete.
   2. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that may cause spalling.

C. Fly Ash:
   1. ASTM C 618, Type C.

D. Water:

1. Clean, potable and free of substances detrimental to concrete and reinforcing.

E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.

F. Air-Entraining Admixture: ASTM C 260 certified compatible with other required admixtures by the manufacturer.
   1. **Air-entraining is required for all exterior concrete**. 6% +/- 1% content.
   2. Products: Subject to requirements, provide one of the following:
      a. Air-mix or Perma-Air, Euclid Chemical Co.
      b. Darex AEA or Daravair, W.R. Grace
      c. Sealtight AEA, W.R. Meadows

G. Water Reducing Admixture, and other Retarders/Accelerators:
   1. Where required, shall comply with ASTM C 494, Type A. Use only admixtures which have been tested and accepted in mix designs, unless otherwise acceptable. Submit all admixes for review.
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Eucon WR-91, Euclid Chemical Co.
      b. Pozzolith, Normal or Polyheed, Master Builders, Inc.

H. Calcium Chloride:
   1. Calcium chloride will not be permitted in concrete. Use cold weather non-chloride, non-corrosive set accelerators only with written approval of Architect. Provide Product Data for Architect approval prior to use in accordance with 1.04 “Submittals”.

2.02 CONCRETE MIX DESIGN:

A. Proportion normal weight mixes by either laboratory trial batch or field experience method, complying with ACI 211.1.
   1. Submit written reports of each proposed mix for each class of concrete to Architect at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by the Architect.
   2. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and reviewed by the Architect.

B. Use air-entraining admixture in all concrete which will be exposed to freezing and thawing, providing not less than 5% or more than 7% entrained air and in compliance with ACI 301, Table 3.4.1.

C. Use set-retarding admixtures during hot weather only when approved by Testing Laboratory.

D. Limit the use of fly ash to not exceed 20 percent of cement content by weight.

E. Design the mix to produce standard weight concrete consisting of Portland cement, aggregate, water, and specified admixtures to produce the following properties:
   1. Compressive Strength: If greater compressive strength values are indicated on Structural Drawings, they shall take precedence over the following.
      a. Exterior flat work, low walls: 3,500 psi minimum at 28 days
      b. Foundations and footings: 3,000 psi minimum at 28 days
      c. Air-Entrained: 4000 psi minimum, water/cement ratio 0.44
   2. Slump Range:
      a. Ramps, slabs, and sloping surfaces - Not more than 3"
      b. Reinforced foundation systems - Not less than 2” and not more than 4”
      c. Concrete containing high-range water reducing admixture after attaining a site-verified 2-4” slump concrete - Not more than 8”
      d. Other concrete - Not more than 4”
   3. Water Cement Ratio:
      a. The maximum water-cement ratio shall be in accordance with ACI 301 except as follows:
         1) For thin sections (railings, curbs, sills, ledges, ornamental work) and sections with less than 1" cover over steel, maximum water-cement ratio for severe weathering area shall not exceed 0.45.

2) For all other structures in severe weathering area, maximum water-cement ratio shall not exceed 0.50.

4. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics f materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.03 ADMIXTURES:

A. Use water-reducing admixture or high-range water-reducing admixture in concrete, as required for placement and workability.

B. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated, Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent with the following limits:

1. Concrete structures and slabs exposed to freezing and thawing, de-icer chemicals, or hydraulic pressure:
   a. 5.5 percent of 1-1/2" maximum aggregate.
   b. 6 percent for 1" maximum aggregate.
   c. 6 percent for ¾" maximum aggregate
   d. 7 percent for ½" maximum aggregate.
2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.
3. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.04 FORM MATERIALS:

A. General:

1. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
2. Provide Pre-manufactured forms from the following companies:
   a. Symons
   b. Greenstreak
   c. SpecFormliners
   d. Fitzgerald Formliners

B. **Exposed Concrete Surfaces**. See Documents for requirements of formwork, and choose from the following:

1. Wood/Non-Specific Form Materials:
   a. Exposed surface form materials: Clear surface MDO plywood, metal, metal-framed plywood or other acceptable panel-type materials with strength and stiffness to leave straight surface with less than 1/8" deflection between studs. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
   b. This formwork shall be used as needed for all smooth surface requirements at the choice of the contractor and as reviewed/approved by the Architect.
2. Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces. Use largest practical sizes to minimize form joints.

C. **Unexposed Concrete Surfaces**:

1. Suitable material for project conditions.
2. Hand trim sides and bottom of earth forms. Maintain a clean bottom. Remove loose soil prior to placing concrete.
3. Earth sides are not allowed for grade beams and footings. Form grade beams and footings with wood materials.

D. Erection of Formwork:

1. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
2. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
3. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
4. Align joints and make watertight. Keep form joints to a minimum.
5. Obtain approval before framing openings in structural members that are not indicated on Drawings.
6. Provide fillet or chamfer strips on external corners of walls.
7. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.
8. Coordinate this section with other sections of work that require attachment of components to formwork.
9. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect/Engineer.

E. Formwork Accessories:
1. Form Ties: Snap off type, factory-lubricated, galvanized metal, fixed length, cone type, 11/2 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.
2. Form Release Agent: Colorless releasing agent with a maximum of 350 mg/l volatile organic compounds (VOCs) which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
3. Corners: Chamfered, rigid plastic or wood strip type; 3/4 x 3/4 inch size; maximum possible lengths.
4. Dovetail Anchor Slot: Galvanized steel, 22-gage thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
5. Flashing Reglets: Rigid PVC, 22 gage thick, longest possible lengths, with alignment splines for joints, release tape sealed slots, anchors for securing to concrete formwork.
6. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
7. Waterstops: Rubber or Polyvinyl chloride, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

2.05 REINFORCING MATERIALS:

B. Steel Reinforcement:
1. Reinforcing Steel: ASTM A 615, Grade 60, 60 ksi yield grade; deformed billet steel bars, unfinished.
2. Welded Steel Wire Fabric: ASTM A 185 Welded Steel Wire Fabric; in flat sheets; unfinished.
3. Galvanized Reinforcing bars: ASTM A 767, Class II (2.0 oz. zinc psf) Class I (3.0 ox. zinc psf) hot-dip galvanized, after fabrication and bending.
4. Epoxy-coated Reinforcing Bars: ASTM A 775.
5. Steel Wire: ASTM A 82, plain, cold-drawn steel.

C. Accessories:
1. Tie Wire: Minimum 16 gage annealed type.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture. Use wire bar-type supports complying with CRSI specifications.
   a. Slab-on-grade – use supports with sand plates or horizontal runners where base material will not support chair legs.
3. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel, size and shape as required.

2.06 RELATED MATERIALS:

A. Moisture-Retain Cover: the following shall comply with the ASTM C 171:
   1. Waterproof paper
   2. Polyethylene film
   3. Polyethylene-coated burlap

B. Membrane Forming Curing Compound:
   1. Where required, apply Type 1 Class A acrylic dissipating resin type, clear translucent compound, complying with ASTM C 309. Coordinate type as appropriate for application and field conditions.
      a. Apply curing compound in accordance with manufacturer's instructions.
      b. Or Architect approved equal, under provisions of Section 01600.
   2. New concrete slabs to receive floor tile finish shall **not** be treated with curing or acceleration compounds, form-release agents or other additives that will interfere with tile bonding.

C. Bonding Agent: Polyvinyl acetate or acrylic base. Subject to compliance with field conditions, provide one of the following:
   1. Polyvinyl Acetate (Interior only)
      a. Superior Concrete Bonder, (J-41) Dayton Superior Corp.
      b. Euco Weld, Euclid Chemical Co.
      c. Everweld, L&M Construction Chemical, Inc.
   2. Acrylic or Styrene Butadiene:
      a. Day-Chem Ad Bond, Dayton Superior Corp.
      b. SBR Latex, Euclid Chemical Co.
      c. Daraweld C, W.R. Grace & Co.

D. Epoxy Adhesive: Per ASTM C881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements. Subject to compliance with field conditions, provide one of the following:
   1. Resi-Bond (J-58), Dayton Superior
   2. Euco Epoxy System #452 or #620, Euclid Chemical Co.
   3. Rexi-Weld 1000, W.R. Grace & Co.

E. Joint Fillers and Sealants:
   1. See Section 07900.

PART 3 - EXECUTION

3.01 FORMING AND PLACING CONCRETE:

A. Placing Concrete: Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur. Place concrete to scoring pattern indicated on drawings. All joints to be straight lines, or smooth curves at the direction of the Architect.
   1. Place concrete in accordance with ACI 301.
   2. Ready-Mixed Concrete: ASTM C 94.
   3. Hot Weather Placement: ACI 301.
   4. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.

B. Preparation:
   1. Place moisture barrier over between layers of compacted fill, just prior to placement of reinforcement. Keep foot traffic over moisture barrier to a minimum. Lap all joints a minimum of 6".
   2. Tape all moisture barrier joints with approved material/system as recommended by the manufacturer.

C. Formwork:

1. Construct so that concrete members and structures are of correct size, shape, alignment, elevation and position, complying with ACI 347.
   a. Provide Class A tolerances for concrete surfaces exposed to view.
   b. Provide Class C tolerances for other concrete surfaces.
2. Provide openings in framework to accommodate work of other trades, accurately place, and securely support items built into forms.
3. Align staples or other fasteners holding form liners in place with seams to conceal in finished work.
4. Clean and adjust forms and form liners prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement, if required, to eliminate mortar leaks.
5. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
6. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

D. Steel Reinforcement:
1. Reinforcement shall meet ACI 301/318 requirements. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
   a. Install welded wire fabric in lengths as long as practicable. Lab adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
   b. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that may reduce or destroy bond with concrete.
2. Unless otherwise noted, reinforcing shall have a Class B splice.
3. Interrupt reinforcement at expansion joints.

E. Joints:
1. Joints shall meet ACI 301 requirements. Provide expansion, control (contraction), construction and any other decorative or required joints as indicated on Drawings. If none shown, Contractor shall install joints conforming to ACI 301 requirements and best industry standards and practices. Typical “contraction joints” or control joints should be at approx. 2x the slab thickness in feet (ie. – 4” slab thickness = 8 foot control intervals). **Contractor shall provide joint layout for Architect approval for all Decorative concrete construction.**
2. Locate construction joints so as to not impair the strength and appearance of the structure. Place isolation and control joints in slabs-on-ground to stabilize differential settlement and random cracking.
3. All joints to be neatly made straight lines or smooth curves if shown to complete an Architectural pattern.

F. Installation of Embedded Items:
1. Embedded items shall meet ACI 301 requirements. Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting diagrams, templates and instructions provided by others for locating and setting.

G. Concrete Placement:
1. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
2. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all part of forms.
3. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing – for the entire length of time required to achieve design strengths.

a. In cold weather, comply with ACI 306.
   1) Do not use calcium chloride, salt or other materials containing anti-freeze agents. Use non-chloride or non-anti-freeze containing cold weather agents only with Architect's approval.
   2) Use chemical accelerators only as accepted in mix designs.
b. In hot weather, comply with ACI 305.
   1) Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90°F (32°C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2) Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
   3) Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
   4) Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.
c. Maintain future, ambient temperatures during curing to minimize 'temperature contraction'. Any slabs with 4" – 6" slab thicknesses shall have contraction joints per ACI 304 and in strict accordance with contraction joint frequencies.
   1) Per ACI 360 – Design of Slabs-on-Ground, follow recommendations to minimize shrinkage and curling of slabs.

3.02 **CONCRETE FINISHES**:

A. Finishing Formed Surfaces:
   1. Exposed-to-View Surfaces – Float Finish:
      a. Apply float finish to monolithic slab surfaces that are exposed-to-view. After screeding, consolidate and level concrete surface. Do not work surface until ready for floating. Float using float blades or float shoes only when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats. Level uniformly tolerance of F(F) (floor flatness) and F(L) (floor levelness) according to ASTM E 1155.
         1) F (F) 20, local F (F) 15
         2) F (L) 15, local F (L) 10
   2. Non-Slip Broom Finish for all horizontal tread:
      a. Apply non-slip broom finish to exterior concrete walks and elsewhere as shown on the Drawings. Immediately after trowel finishing, slightly roughen surface by drawing a fiber bristle broom across surface, perpendicular to main traffic route.
   3. Vertical Surfaces:
      a. Exposed-to-View Formed Finish: **Rub out** vertical surfaces of formed concrete work to remove minor surface imperfections and variations.
      b. Not-Exposed-to-View - Rough-Formed Finish: Imperfections allowed.

3.03 CURING:

A. Curing of concrete shall meet ACI 301, and 305 or 306 (as appropriate), beginning as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by use of moisture-retaining cover, or (unless otherwise prohibited) membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.

3.04 QUALITY CONTROL TESTING DURING CONSTRUCTION:

A. Testing laboratory employed by the Owner will perform sampling and testing during concrete placement in accord with requirements of ACI 301, which may include the following:
   1. Sampling:
      a. ASTM C 172
   2. Slump:
      a. ASTM C 143, one for each set of compressive strength specimens or whenever concrete consistency appears to vary, but not fewer than one for each load at point of discharge.
   3. Air Content:
      a. ASTM C 173, one for each set of compressive strength specimens.
   4. Compression Test Specimen:
      a. ASTM C 31, one set of 6 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
   5. Compressive Strength:
      a. ASTM C 39, one set for each 50 cubic yards or fraction thereof of each class of concrete; 2 specimens tested at 7 days, 3 specimens tested at 28 days, and one retained for later testing if required.
      b. When the total quantity of a given class of concrete is less than 50 cubic yards, the strength tests may be waived by the Architect or testing agency if field experience indicates evidence of satisfactory strength.

B. The testing laboratory employed by the Owner shall report test results, in writing, to the Architect, the Owner, Contractor and concrete producer on same day tests are made.

C. The Contractor shall give 48 hours prior notice to the testing laboratory employed by the Owner of his intention to place concrete.

3.05 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.

B. Mix dry-pack mortar, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
   1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
   2. For surfaces exposed to view, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas 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.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.
   1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
   1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate

to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.

2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces 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. Proprietary underlayment compounds may be used when acceptable to Architect.
4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

E. Repair isolated random cracks and single holes 1 inch or less in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Place dry-pack before bonding agent has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

F. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

G. Repair methods not specified above may be used, subject to acceptance of Architect.

END OF SECTION 03300

SECTION 05040 - HOT DIP GALVANIZING

PART I - GENERAL

1.01 WORK INCLUDED

This specification covers iron and steel materials to be hot dip galvanized after manufacture or fabrication including, but not limited to:

A. Steel Pipe
B. Fasteners and Miscellaneous Hardware.
C. Fencing Materials.
D. Any Ferrous item exposed to the weather.

1.02 WORK INCLUDED

A. Hot dip galvanizing of iron and steel materials.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

A. Steel materials, fabrications, and assemblies are specified to be furnished installed in various other sections.
B. Section 05520 – Handrails and Railings

1.04 REFERENCES

A. Publications:
   1. American Galvanizers Association (AGA):
      a. Inspection of Products Hot Dip Galvanized After Fabrication
      b. The Design of Products to be Hot Dip Galvanized After Fabrication
      c. Recommended Details of Galvanized Structures
   2. Research Council on Structural Connections of the Engineering Foundation:
      a. Specification for Structural Joints Using ASTM-A325 or A490 bolts
B. Reference Standards:
   1. American Society for Testing and Materials (ASTM):
      b. A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
      c. A143 Safeguarding Against Embrittlement of Hot-Dip Galvanized
      d. Structural Steel Products and Procedure for Detecting Embrittlement
      e. A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
      f. A384 Safeguarding Against Warpage and Distortion During Hot-Dip
      g. Galvanizing of Steel Articles
      h. A385 Providing High-Quality Zinc Coatings (Hot-Dip)
      i. A767 Specification for Zinc-Coated (Hot-Dip Galvanized)
      j. Steel Bars for Concrete Reinforcement
      k. A780 Repair of Damaged Hot-Dip Galvanized Coatings
C. Federal Specifications:
      a. DOD-P-21035, Paint, High Zinc Dust Content, Galvanizing Repair
      b. MIL-P-26915, Primer Coating, Zinc Dust Pigmented

1.05 QUALITY ASSURANCE

A. Coating Applicator: Company specializing in hot dip galvanizing after fabrication and following the procedures of the Quality Assurance Manual of the American Galvanizers Association.
B. Company specializing in DUROZINQ® to assure quality and on time guaranteed delivery.
C. ISO 9002 Certified within the last five years and audited yearly.

1.06 SUBMITTALS

A. In accordance with provisions of Section 01300, submit an original and two copies of the coating applicator's Certificate of Compliance that the hot dip galvanized coating meets or exceeds the specified requirements of ASTM-A 123 A767 or A153 (as applicable).
B. Applicator must submit quality assurance certification and ISO 9002 certification, and auditor's yearly report for the past 3 years.

1.07 DELIVERY, STORAGE AND HANDLING

A. Store and protect products under the provisions of Section (01600), (01620).
B. Load and store galvanized articles in accordance with accepted industry standards.

PART 2 - PRODUCTS

2.01 ACCEPTABLE COATING APPLICATORS

A. Applicator must be ISO 9002 certified to assure premier quality standards
B. American Galvanizing Association members available upon request from the American Galvanizing Association.

2.02 STEEL MATERIALS

A. Material for galvanizing to be geometrically suitable for galvanizing as described in ASTM-A 384 and A385. Steel materials suitable for galvanizing include structural shapes, pipe, sheet, fabrications and assemblies.
B. Material to be chemically suitable for galvanizing Steels containing carbon below 0.25 percent, phosphorus below 0.04 percent and manganese below 1.35 percent, either individually or in combination, and providing the silicon content is .04 percent or less or a range of 0.15-0.23%, will normally develop a typical coating when conventional galvanizing techniques are applied. In cases where a steel is selected for considerations other than galvanizing and the chemistry of the elements (C, Mn, P, and Si) exceeds the limits indicated above, the steel may be galvanizable. The galvanizer must be advised of the variation in advance so that he can determine if the material is galvanizable and whether or not special processing techniques will be required or different appearance and bonding is acceptable. Experience has shown that silicon in the ranges of 0.02 to 0.04% and 0.15 to 0.23% produce coatings of normal integrity and performance. Steels with silicon contents significantly below 0.04% may not achieve the desired minimum coating thicknesses. Steel with silicon above 0.23% can have less bonding and adhesion, as well as, a higher milage and dull appearance. Recommended steel materials for hot dip galvanizing include, but are not limited to:
   1. Structural shapes and plates: ASTM-A 36, A242 type 2, A283, A441, A500, A501, A529, A572 and A588.
   2. Steel for fasteners:

General Category	Bolt Material	Nut Material
Carbon Steel	A307 GR A or B	A563 GR A
High Strength	A325 Type I	A563 GR DHor
Tower Bolts	A394	A563 GR A
Quenched & Tempered Carbon Steel Bolts	A449	A563 GR C
Quenched & Tempered Alloy Steel Bolts	A354 GR BC	A563 GR DH

2.03 FABRICATION REQUIREMENTS

A. Fabricate structural steel in accordance with Class (I), (II), (III) guidelines as described in AGA's; Recommended Details for Galvanized Structures.
B. Fabrication practices for products to be in accordance with the applicable portions of ASTM-A 143, A384, and A385, except as specified herein. Avoid fabrication techniques, which could cause distortion or embrittlement of the steel.
C. The Fabricator shall consult with Architect/Engineer and Hot Dip Galvanizer regarding potential problems or potential handling problems during the galvanizing process, which may require modification of design before fabrication proceeds.
D. Remove all welding slag, splatter, anti-splatter compounds and burrs prior to delivery for galvanizing. When weldments are to be galvanized, avoid the use of a high silicon welding rod. (An AGA member can advise on welding rod best suited for architecturally exposed material).

E. Provide holes and/or lifting lug to facilitate handling during the galvanizing.
F. Avoid unsuitable marking paints. Use only water-soluble markers. Consult with the galvanizer about removal of grease, oil paint and other deleterious material prior to fabrication.
G. Remove by blast cleaning or other methods surface contaminants and coatings which would not be removable by the normal chemical cleaning process in the galvanizing operation.
H. Whenever possible, slip joints should be used to minimize field welding of materials.
I. To minimize handling damage, trucking to and from the galvanizer must be the responsibility of the galvanizer utilizing galvanizers company owned truck or by prior written agreement between steel fabricator and galvanizer.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Pre-clean steel works in accordance with accepted methods to produce an acceptable surface for quality hot dip galvanizing.

3.02 APPLICATION OF COATING

A. Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with ASTM-A 123.
B. Galvanize bolts, nuts, washers, iron and steel hardware components in accordance with ASTM-A 153. For best results this material will be galvanized in a kettle capable of reaching 1000 degrees Fahrenheit.
C. Safeguard products against steel embrittlement in conformance with ASTM-A 143.
D. Galvanize reinforcing steel in accordance with ASTM-A 767.
E. Handle all articles to be galvanized in such a manner as to avoid any mechanical damage and to minimize distortion.
F. To minimize surface imperfections use of the galvanizing process involving a flux blanket on the kettle (wet method) is prohibited.

3.03 COATING REQUIREMENTS

A. Coating Weight: conform to paragraph 5.1 of ASTM-A 123, table I of A767, or table I of ASTM-A 153, as appropriate. Special thickness requirements should refer to ASTM-A 123 paragraph 3.1 section 7 and be specified as the minimum average mils of thickness. Extra thick coatings are not always obtainable.
B. Surface Finish: Continuous, adherent, as smooth and evenly distributed as possible and free from any defect detrimental to the stated end use of the coated article.
C. Adhesion: Withstand normal handling consistent with the nature and thickness of the coating and normal use of the article.

3.04 TESTS

A. Inspection and testing of hot dip galvanized coatings shall be done under the guidelines provided in the AGA publication, "Inspection of Products Hot Dip Galvanized after Fabrication".
B. Include visual examination and tests in accordance with ASTM-A 123, A 767 or A 153 as applicable to determine the thickness of the zinc coating on the metal surface.
C. Furnish Certificate of Compliance with ASTM Standards and Specifications herein listed. The Certificate must be signed by the galvanizer and contain a detailed description of the material processed. The Certificate shall include information as to the ASTM standard used for the coating.
D. Furnish a detail description as outlined in the Galvanizer ISO 9002 Quality Compliance certification.

3.05 REPAIR FOR DAMAGED COATING

A. The maximum area to be repaired is defined in accordance with ASTM-A 123 Section 4.6 current edition.

I . The maximum area to be repaired in the field shall be determined in advance and prior to the start of fabrication by mutual agreement between parties. (galvanizer, fabricator, architect/owner)

B. Repair areas damaged by welding, flame cutting or during handling, transport or erection by one of the approved methods in accordance with ASTM-A 780 whenever damage exceeds 3/16" in width. Minimum thickness requirements for the repair are those described in ASTM-A 123 section 4. 6 current edition.

C. **When using the zinc-rich paint method of repair in accordance to ASTM-A 780, the use of aerosol (spray) cans is prohibited. Using a brush applied paint product for touch up of the galvanized surface is the only paint repair acceptable.**

END OF SECTION 05040

SECTION 05520 – HANDRAILS, RAILINGS AND IN-FILL PANELS

PART 1 - GENERAL

1.01. SECTION INCLUDES:
- A. Steel pipe handrails, balusters, and fittings.
- B. Inserts to receive handrail systems in horizontal surfaces
- C. Furnishing and installing all materials, labor and equipment necessary to fabricate and completely install railings and/or balustrades as shown on the drawings or specified herein.

1.02. RELATED SECTIONS:
- A. Section 03300 - Cast In Place Concrete: Placement of anchors/inserts in concrete.
- B. Section 05040 - Galvanizing
- C. Section 05120 - Structural Steel and Miscellaneous Steel
- D. Section 09900 - Painting: Paint finish.

1.03. REFERENCES:
- A. ASTM A53 - Hot Dipped, Zinc coated Welded and Seamless Steel Pipe.
- B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. A 153/A 153M (2001A) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- D. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- E. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- F. ASTM B211 - Aluminum-Alloy Bars, Rods, and Wire.
- G. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- H. ASTM B241 - Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- I. ASTM B483 - Aluminum and Aluminum-Alloy Drawn Tubes For General Purpose Applications.
- J. ASTM E935 - Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
- K. ASTM E985 - Permanent Metal Railing Systems and Rails for Buildings.
- L. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
- M. ALUMINUM ASSOCIATION (AA)
  1. AA 45 (1997) Designation System for Aluminum Finishes
  2. ABH-21 Aluminum Brazing Handbook
  3. ASD-1 Aluminum Standards and Data
  4. DAF-45 Designation System for Aluminum Finishes
  5. SAA-46 Standards for Anodized Architectural Aluminum

1.04. QUALITY ASSURANCE:
- A. Work shall be furnished and erected by a single firm to assure undividable responsibility.
- B. Alternate manufacturers for referenced manufacturer's product shall be approved by the Architect by pre-qualifying not less than seven (7) days prior to close of bids.

1.05. DESIGN REQUIREMENTS:
- A. Fabricate railing assemblies, wall rails, and attachments to ASTM E985.
- B. Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each metal fabrication.
  1. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
     a. Concentrated load of 200 lb. applied at any point non-concurrently with additional

loads, vertically downward, or horizontally.
b. Uniform load of 100 lbf applied vertically downward and 50 lb. per foot applied horizontally, applied concurrently.
c. Concentrated and uniform loads above shall not act concurrently.

2. Handrails Not Part of Guardrail System: Capable of withstanding the following loads applied as indicated:
a. Concentrated load of 200 lbf applied at any point non-concurrently, vertically downward or horizontally.
b. Uniform load of 50 lbf applied non-concurrently, vertically downward or horizontally.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf applied to one sq. ft. at any point in the system including panels, intermediate rails balusters, or other elements composing the infill area.
a. Above load need not be assumed to act concurrently with uniform horizontal loads on top rails of railing systems in determining stress on guard.

1.06. SUBMITTALS FOR REVIEW:
A. Section 01300 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1.07 PRE-INSTALLATION MEETING:
A. Prior to the beginning of work, conduct a pre-job conference at the job site **and a separate pre-job inspection of fabrication facilities.**
B. Provide seven calendar days advance written notice ensuring the attendance by competent authorized representatives of the fabricator, building owner's representative and architect.
C. Review the specifications to determine any potential problems, changes, scheduling, unique job site conditions, installation requirements and procedures and any other information pertinent to the installation.
D. Record the results of the conference and furnish copies to all participants

1.08 INCONSISTENCIES:
A. In the case that a discrepancy exists between two or more stated or implied characteristics of any product, assembly, technique, and application, etc., between any one or more Sections of this Project Manual, any one or more Paragraphs of this Specification, or between the Drawings and Specifications, the Contractor's Bid amount shall reflect the most costly version or combination of the requirement(s).

PART 2 – RAILING SYSTEM'S PRODUCTS:

2.01 FERROUS METAL RAILING SYSTEMS:
A. Ferrous Metals Railing components:
1. General: For fabrication of miscellaneous metalwork which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seams, rollermarks, rolled trade names and roughness.
2. Steel plates, shapes and bars: shall meet ASTM A36.
3. Steel pipe - shall meet ASTM A 53:
a. Pipe shall be Schedule 40 pipe, "standard pipe" designations - 1-1/2" diameter (approx. 1.9" O.D.) typical.
b. Type and grade as selected by fabricator for particular installation and as required for design loading:
1) Type S (seamless), Grade B (30 ksi), standard weight (Schedule 40), unless another grade, weight, or both required by structural loads.
c. Pipe shall be black finish and primed at interior installations only.
d. Pipe shall be galvanized and prime finish for all exterior installations.

e. All pipe diameters shall conform to Barrier-Free requirements.

4. Concrete inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47 or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

B. Fittings:
1. Same material as fastened metal; concealed unless otherwise indicated or unavoidable and standard with systems indicated.
2. Elbows, T shapes, wall brackets, end caps, escutcheons shall be stamped or cast steel typical.
3. All connections shall be welded and ground smooth prior to finishing.

C. Mounting Accessories:
1. Adjustable brackets and flanges, with steel inserts for casting in concrete
2. Prepare backing plate for mounting in metal stud wall construction.

D. Exposed Fasteners:
1. General: provide zinc-coated fasteners for exterior use or where built into exterior construction.
2. Flush, countersunk screws or bolts; consistent with design of railing.
3. Lag bolts: square heads type
4. Toggle Bolts: tumble-wind type, dia. as required withstanding 300# lateral force.

E. Concrete Fill:
1. Concrete materials and Properties: Comply with requirements of Division 3 Section - 'Concrete Work' for normal weight, ready-mix concrete with minimum 28 day compressive strength of 2500 psi, 140 lbs. cement per cu. ft. minimum and W/C ratio of 0.65 maximum, unless higher strengths indicated.

2.02 ACCESSORY COMPONENTS:

A. Connect all handrail and guard systems with butt-welding or with welded, internal connectors.
B. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms.
C. Filler Plates: provide steel sheet or plate fillers required to support structural loads of handrail systems to structural supports. All plates and fillers shall be continuously welded and ground smooth to appear as a contiguous piece.
D. Close ends of all pipes or tubes. Use rounded end caps unless noted otherwise.
E. Provide wall returns at all ends terminating at a wall surfaces.
F. Grout/Anchoring Cement: Non-shrink nonmetallic grout: CE CRD-C621 or erosion-resistant anchoring cement; non-staining, non-corrosive, nongaseous, recommended by manufacturer for types of applications indicated.
G. Provide an epoxy filler around all tube sections inserted into sleeve-inserts in exterior applications

2.03 FINISHING:

A. Galvanizing: To ASTM A123, provide minimum 1.25 oz/sq ft galvanized coating.
1. Touch-Up Primer for Galvanized Surfaces: SSPC 20 Type II Organic zinc rich.

B. Provide bituminous coating for all metal parts in contact with concrete.
C. Surface Preparation: Solvent-clean surfaces in compliance with SSPC-SP 1 to remove dirt, oil, grease and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel in compliance with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
D. Factory-Priming for Field-Painted Finish: Apply shop primer immediately following surface preparation and pretreatment.
1. Shop primer for ferrous metal: Manufacturers of fabricator's standard, fast-curing, lead-free, Zinc-chromate primer; selected for good resistance to atmospheric corrosion, for compatibility with finish paint systems indicated and for compatibility to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.
2. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

PART 3 - EXECUTION:

3.01. EXAMINATION:
A. Verify that field conditions are acceptable and are ready to receive work.

3.02. GENERAL FABRICATION:
A. Fit and shop assemble components in largest practical sizes for delivery to site.
B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
C. Provide anchors required for connecting railings to structure.
D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
F. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
G. Interior Components: Continuously seal joined pieces by continuous welds.
H. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
I. Accurately form components to suit stairs and landings, to each other and to building structure. Notify the Architect prior to erection if dimensions and clearances noted in Documents do not correspond to field conditions.
J. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

3.03. HANDRAIL FABRICATION:
A. Fabricate steel pipe railings and handrails to design, dimensions, and details indicated. Provide railing and handrail members formed of pipe sizes and wall thickness indicated, but not less than that required to support design loading. All diameters shall comply with Barrier-Free requirements for grasp-ability.
B. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
3. At tee and cross intersections provide seamless coped joints.
4. At bends interconnect pipe by means of flush radius bends, as applicable, or radiuses indicated.
C. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.

3.04. PREPARATION FOR INSTALLATIONS:
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
C. Supply items required to be cast into concrete with setting templates, to appropriate sections.

3.05. INSTALLATION:
A. Install in accordance with manufacturer's instructions for all manufactured items.
B. Install components plumb and level, accurately fitted, free from distortion or defects. Coordinate with Architect for any elements that will not fit to building components in a straight and true alignment.
C. Anchor railings to structure with anchors
D. Conceal bolts and screws whenever possible.

E. Field welding: comply with AWS Code for appearance and quality of welds.
F. Corrosion protection: coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood or other dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.
G. Corrosion protection: coat concealed surfaces of ferrous metals that will come into contact with grout, concrete, masonry or other dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.
H. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.06. ERECTION
A. Adjust railings prior to anchoring to ensure matching alignment at all butting joints.
B. For railing posts set in concrete provide sleeves of galvanized steel pipe not less than 8" long and with an inside diameter not less than 1/2" greater than the outside diameter of pipe to be inserted. Provide steel plate closure welded to bottom of sleeve and of width and length not less than 1" greater than outside diameter of sleeve to resist pull-out.
C. Anchor posts in concrete by core drilling holes not less than 6 inches deep and ¾” greater than outside diameter of post. Clean holes of loose debris, insert posts and fill space between post and concrete with non-shrink, nonmetallic grout or anchoring cement.
D. Secure handrails to wall with wall brackets and end fittings. Set with not less than 1-1/2” clearance from inside face of handrail to finished wall surface.

3.07. ERECTION TOLERANCES:
A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05520

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to the work of this section.

1.02 WORK INCLUDED:
- A. General: The terms "paint" or "painting" as used in the Drawings and this Section are general terms which shall, by definition, include surface preparations required of finishes, and the application of fillers, finishes, sealers, primers, stains, paints, and/or varnishes.
- B. Preparation of all surfaces and materials to receive finish.
- C. Painting of all surfaces indicated and exterior exposed and/or unfinished items and surfaces throughout the project, including, but not limited to the following:
  - **1. Handrail system at stairs**

1.03 RELATED WORK SPECIFIED ELSEWHERE:

Shop priming.

1.04 COLOR SCHEDULES AND SAMPLES:
- A. See Color Coordination, below.
- B. After the beginning of construction (see 'Color Coordination' paragraph, below), the architect will prepare a color schedule for color and finish requirements for each painted or finished surface for this project. The schedule may include color chips for matching.
- C. Notify the Architect prior to mobilizing for painting so samples of colors and/or finishes may be requested.
- D. The Architect reserves the right to select colors from Manufacturer's standard or premium price groups, including deep tone colors for both interior and exterior products.

1.05 ATTIC STOCK:
- A. Leave on premises, one unopened gallon of each color of each type of paint or finish used.
- B. Containers to be unopened after preparation at the factory, tightly sealed, bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and/or reducing.

1.06 DELIVERY, STORAGE AND HANDLING:
- A. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing and/or reducing.
- B. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F. in a well-ventilated area.
- C. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.07 SUBMITTALS:
- A. Within thirty (30) days after an award of bid, the painting contractor shall submit a statement to the architect indicating both the manufacturer of paint of finish products to be used on the job, and the specific brand name for each usage specified.
- B. The architect reserves the right to request and receive copies of invoices for material purchased for this project from the various manufacturers and/or dealers.
- C. The painting contractor shall provide the architect with (2) complete and current color decks from the select manufacturer to select colors from. One color deck will be retained by the Architect.

1.08 MANUFACTURER CERTIFICATION:

A. Manufacturer shall certify that tests have been performed on semi-gloss wall finish and others selected by Architect. Testing shall include the following (or equivalent) tests:
   1. Scrub resistance ASTM D2486-79: Value as specified in approved schedule, but not less than 1,200.
   2. Washability ASTM D3450-80: Value as specified in approved schedule but not less than 80% for sponge and 90% for brush.

1.09 MIXING, THINNING, AND STORAGE:
A. Store and mix paints only in areas designated and provided with proper proptection fro floors and walls.
B. Mix and thin paints in strict accordance with Manufacturer's recommendations.
C. Deliver and store paints and related flammable materials in the Manufacturer's original unopened containers, as far as practicable. Keep partially used materials in tightly closed containers.
D. Do not store oil or paint soaked rags inside the building. Do not store materials in any room containing a direct fired heating unit.

1.10 ENVIRONMENTAL CONDITIONS:
A. A minimum interior temperature of 65 degree F shall be maintained during the actual application and drying of the paint, and until occupancy of the building occurs. Adequate ventilation shall be maintained at all times to control excessive humidity that will adversely affect the curing of coatings. The general contractor is solely responsible for maintaining suitable temperatures and ventilation.
B. No exterior painting shall be undertaken if air or surface temperatures are below 50 degree F, or if the temperature is expected to drop below that mark before the coating has dried. do not paint during or immediately after foggy, rainy, or frosty weather, or until frost, dew or condensation has evaporated. Ambient air temperature and surface temperature must be minimum 5 degree F above dew point.
C. Surfaces shall be dry before any coating is applied. New plaster, masonry and concrete work shall not be primed until it has been determined these substrates have dried sufficiently and are of suitable Ph to safely accept paint. A reliable electronic moisture meter shall be used to make the determination pertaining to moisture.
D. Adequate lighting shall be provided in work areas to assure adequate illumination. See Division 1, for temporary electric requirements.
E. Do not commence work in spaces until all other trades other than finish work trades have completed their work within the space.

1.11 PROTECTION:
A. Close off the various spaces while painting and exclude dust until finish is dry.
B. Adequately protect adjacent surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.
C. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
D. Place cotton waste, cloths and materials that may constitute a fire hazard in closed metal containers and remove daily from site.
E. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned and replaced on completion of work in each area. When cleaning hardware, do not use solvent that may remove permanent lacquer finish.

1.12 QUALITY ASSURANCE:
A. General: Work shall be performed by tradesmen with at least (5) five years experience with similar types of preparation and application as required by this Project.

B. Refinishing and/or refurbishing woodwork: Work shall be performed by tradesmen with at least (5) five years experience, and who are capable of evaluating wood surfaces, stripping, fine sanding, and refinishing hardwood and softwood surfaces.

1.13 INCONSISTENCIES:

A. Refer to Section 00100 – Instructions to Bidders for General Contractor, Construction Manager, and/or sub contractor responsibilities pertaining to Specification inconsistencies.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. All **paint** materials shall be products of:
   1. Pittsburgh Paint Company
   2. Benjamin Moore
   3. Sherwin-Williams
   4. Pratt & Lambert
   5. ICI Dulux
   6. Substitutions shall not be made without the architect's prior approval.

B. All materials used on the job shall be the manufacturer's highest quality product for each usage specified.

2.02 MATERIALS:

A. Furnish specified Manufacturer's top quality, first line material, delivered to the job-site in original, unopened, labeled containers.

B. Acceptance of materials is conditional upon demonstration of washability and abrasion resistance of specified test patch.

C. Tinted primer shall be used whenever deep tone colors are specified.

2.03 PRODUCTS:

A. Following are specifications for products for specific applications. Should one or more of the specified manufacturers no longer produce the specified product (due to a change in product line, for example), the Painting Contractor may use another product from the same manufacturer(s) provided the manufacturer warrants that it is substantively similar to the specified product and intended for the specified application.

B. Exterior Finishes:

1. Ferrous, Galvanized Metals:
   a. Prepare ferrous and galvanized metals as herein before specified. See Division 5 for requirements of priming of ferrous metals. Do all touch up and priming on unprimed metals in accordance with requirements of Division 5.
   b. Apply paint in accordance with Steel Structure Painting Council Paint Application Specifications SSPC-PA1 to a dry film thickness as specified by the manufacturer.
   c. First Coat (primer) at ferrous metals (to be used even at shop primed items except as noted in Division 5):
      (i) Benjamin Moore MO4 Acrylic Metal Primer
      (ii) Pittsburgh Paints 90-708 Series Pitt-Tech One-Pack Interior/Exterior Industrial Primer
      (iii) Pratt & Lambert Latex Suprime 3
      (iv) Sherwin-Williams DTM Acrylic Primer/Finish, B66W1
   d. First Coat (primer) at galvanized metals (after thorough cleaning with minerals spirits, changing rags frequently – SSPC-SP1 with VM&P Naptha)
      (i) Benjamin Moore MO4 Acrylic Metal Primer
      (ii) Pittsburgh Paints 90-708 Series Pitt-Tech One-Pack Interior/Exterior Industrial Primer
      (iii) Pratt & Lambert Latex Suprime 3

(iv) Sherwin-Williams DTM Acrylic Primer/Finish, B66W1

e. Second and Third Coats (Ferrous, Galvanized Metals, and Aluminum):
   (i) Benjamin Moore Moorcraft Latex Semi Gloss Enamel 276
   (ii) Pittsburgh Paints 6-512 Speedhide Semi Gloss Latex Enamel
   (iii) Pratt & Lambert Pro-Hide + Latex Satin Enamel
   (iv) Sherwin-Williams Metalatex Semi Gloss Enamel B-42 Series

PART 3 - EXECUTION

3.01 GENERAL:

A. The painting contractor shall be wholly responsible for the quality of the work and is not to commence any part of it until each surface is in proper condition. All surfaces are to be clean. If for any reason the surface cannot be cleaned, this condition shall be promptly reported to the General Contractor and the Architect prior to commencing with the work.
   1. Surfaces shall be properly prepared, dry, and free of any foreign materials such as dirt, dust, oil, grease, rust, scale, mildew, algae, mold, effervescence, release agents, etc., which will adversely affect adhesion or appearance of applied coating.

B. Examine each surface scheduled to be painted or finished prior to commencing with the work. Report any condition that may potentially affect proper application. **Application of first coat constitutes acceptance of surface as being in fit condition to receive paint.**

C. To prevent contamination of the substrate, apply the prime coat to each surface as soon as possible after surface preparation has been completed.

D. Test shop applied primer for compatibility with subsequent cover materials. Report adverse conditions, if any, to the Architect prior to continuing with the work.

E. The Architect may take samples of materials used on the project for testing purposes. Shall samples not match manufacturer's product specifications, no credit will be given for work covered with the questionable material and any cost of test shall be borne by the painting contractor.

F. Test moisture content of each surface using a properly calibrated electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D2016.
   4. Exterior Wood: 15 percent, measured in accordance with ASTM D2016.
   5. Concrete Floors: 8 percent.

G. Do not apply paints when the temperature of or on the substrate or the temperature of the air in the vicinity of the painting work is below 45 degrees or above 95 degrees Fahrenheit. Application shall proceed only when relative humidity is between 20 and 80 percent. Exterior and interior latex paints shall not be applied below 50 degrees Fahrenheit unless so authorized in writing by the manufacturer. Epoxy paints and other sophisticated coating shall not be applied below 50 degrees Fahrenheit unless otherwise noted on the manufacturer's printed instructions.

H. Test Ph of plaster, masonry, and concrete surfaces. Neutralize where required.

I. Remove electrical plates, hardware, light fixture trim, escutcheons, and other miscellaneous fittings prior to preparing surfaces for painting or finishing. Masking will not be accepted.

J. Correct surface defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

K. Seal all marks that may bleed through surface finishes with appropriate stain-stopping coating.

L. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry. Follow manufacturer's recommendations for final preparation.

3.02 PREPARATION OF NEW SURFACES (NOT PREVIOUSLY FINISHED):

A. Ferrous Metal Surfaces
   1. Wash all surfaces with a solvent to remove dirt, grease and oil.
   2. Touch up all bare metal welded areas around screws and damaged shop coats with specified shop coat primer. Primer on welded areas shall be applied after grinding and after welding flux is removed.
B. Galvanized Metal Surfaces
   1. Aggressively clean surface with mineral spirits. Remove surface contamination and oils and wash with solvent.
   2. Abraded areas that have begun to rust shall be immediately sanded clean and spot primed with a rust inhibiting primer.
   3. Prime with specified primer.

3.03 COATS

A. All specified products shall be applied at the minimum wet film thickness rate as recommended by the manufacturer.
B. The number of coats scheduled are minimums. Provide paint finishes free from cloudy or mottled surfaces and with complete coverage of even, uniform color. Spot prime or undercoat as necessary for complete coverage.
C. Apply paints and finishes in the order schedules, unless otherwise directed. Where more than one coat of paint is scheduled, tint undercoats to approximately the same color as the finish coat, but vary the shade of succeeding coats for identification.
D. Do not apply succeeding coats until undercoats are thoroughly dry.
E. After completion of work, do all necessary touching up of all the Painting and Finishing and leave the work in perfect condition.
F. Additional coats will be required where finished work is not in complete compliance with all requirements of these specifications, or if complete coverage is not accomplished in the specified number of coats.
G. All coats specified under this division are in addition to shop priming coats specified under other divisions. A completely finished job is required, regardless of whether every individual item is mentioned herein or not.
H. All painting materials and installation procedures shall comply with all Federal Regulations.
I. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the owner.

3.04 WORKMANSHIP

A. All painting and finishing work shall be done by thoroughly experienced, skilled, competent mechanics and smoothly flowed on without runs, sags, streaks, wrinkles, shiners, or bush marks. Apply proprietary paint products in strict accordance with manufacturer's instructions.
B. Except where specifically authorized by the Architect, apply flat or eggshell wall paint by brush or roller; apply gloss or semi-gloss with brush only.
C. Sanding: In addition to preparatory sanding, fins sand between succeeding coats of all varnish enamel or flat enamel, using sandpaper appropriate to the finish. Use fine production paper between coats.
D. Painting Contrasting Colors: Cut to meet true lines against contrasting colors. Holidays and restrikes in painted surfaces shall be considered sufficient cause to require recoating of entire surface.
E. Execute all painting and finishing work strictly as per approved color and finish samples. Commencing work before obtaining said approvals is at the contractor's risk.
F. Comply with manufacturer's printed directions on labels of all product containers. Primer and finish coats shall be products of the same manufacturer.
G. All suction spots or "hot spots" in plaster and/or cement after the application of the first coat shall be touched up before applying the second coat.

H. Remove electrical panel box covers and doors before painting walls. Paint separately and reinstall after all paint is dry. Remove all finish hardware from walls, doors and cabinets before painting.
I. Enamel finish applied to metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface. All undercoats of paint or enamel to be off shade from other coats such that one coat can be clearly identified from the next.
J. Do all necessary puttying of nail holes, cracks and similar conditions, after first coat, with putty of color matching finish. Bring putty flush with adjoining surfaces.
K. The architect reserves the right to inspect each coat of paint or other finish before application of succeeding coat or else no credit for said coat will be given and the painting contractor automatically assumes responsibility for recoating work in question. Notify architect when each coat is ready for inspection.
L. Finish tops, bottoms, and edges of doors, same as exposed faces. Plastic faced doors with hardwood edges shall have edges stained and finished. Fill edges of exposed plywood doors, panels, and similar materials.
M. Paint all walls and/or framing members behind grilles and at reveals, which will be visible from occupied areas. Paint shall be flat black.
N. Replace hardware after completion as originally installed.

3.05 CLEANING:

A. At conclusion of work and/or when directed, examine all painting and finishing work. Clean paint spots off glass, plaster, metal, fabric wall coverings, wood and other surfaces. Clean and repair paint finish where dark spots, fingerprints, and similar imperfections appear. Said retouching shall exactly match surrounding surfaces. Refinish entire surface in question in order to attain this result if necessary. Leave all painting and finishing in perfect condition.
B. During progress of the work keep premises free from accumulations of tools, equipment, surplus materials and debris. At completion of work leave premises neat and clean.

3.06 SCHEDULE - EXTERIOR SURFACES

A. Steel - Galvanized:
   1. One coat galvanized primer.
   2. Two coats of alkyd enamel, semi-gloss.

END OF SECTION 09900