QUOTE DOCUMENTS

FOR

KING PARKING EXPANSION

1849 Forest Avenue

Des Moines, Iowa

QUOTE # Q6747

Owner

Des Moines Independent Community School District
1917 Dean Avenue
Des Moines, Iowa 50316
SCOPE OF WORK

DOCUMENTS:

A. Drawings - Sheets: C0.1 and C2.1
B. Specifications – Sections : 02230, 02300, 02751, 02764, 02766, 02920, and 02923
C. Scope of Work – May 13, 2013
D. Quote Form with Non Collusion and Targeted Small Business Forms
E. Insurance requirements
F. Acknowledgement and Certification Form
G. Bond forms (Payment and Performance)

INSTRUCTIONS:

1. Submit quotes on enclosed form. Pricing to be submitted not later than 3:00 PM on May 23, 2013. Submit quote form to Des Moines Public Schools at 1917 Dean Avenue, Des Moines, Iowa 50316. Fax or emailed copies of quote forms are acceptable. Send quote forms to the attention of Doug Ohde (FAX 515-265-8702) or douglas.ohde@dmschools.org.
2. Include the enclosed Non Collusion Affidavit and TSB forms with the quote.
3. Recognize any addenda on the quote form.
4. Questions shall be directed in writing to Doug Ohde – douglas.ohde@dmschools.org.
5. The successful firm will be notified on or about May 24, 2013. A purchase order will be provided from the Des Moines Public Schools.
6. Upon receipt of the purchase order the contractor shall submit all shop drawings, samples, and other items for approval.
7. Quote shall exclude all sales and use taxes. The District will provide exemption certificates.
8. The successful firm is required to sign the Sex Offender Acknowledgement and Certification form which is attached.
9. The successful firm shall submit an insurance certificate meeting the insurance requirements of the attached document.
10. Quote security (bid bond) is not required.
11. 100% performance and payment bonds are required at the time of the purchase order from a successful contractor if the quote amount exceeds $25,000. If applicable, include the cost of these bonds in the quote price.

12. The Owner will obtain the permits if required. Contractors are responsible to obtain and pay for any specialty permits.

13. Payments will be made once a month based upon percentage of work completed. A 5% retainage will be withheld monthly until acceptance of all work.

14. Contractor shall fully clean up the project site.

15. Contractor is required to provide all security for their work area and for the safety of other persons.

16. The work is under one lump sum bid package.

17. Contractor shall perform all survey, layout and elevation work on the project.

18. Work can begin on June 17, 2013 and shall be complete on July 12, 2013.

END OF SCOPE OF WORK
DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT

QUOTES DUE NOT LATER THAN 3:00 PM ON MAY 23, 2013

PROPOSAL FOR:  King Parking Expansion
1849 Forest Avenue - Des Moines, Iowa

TO:  Des Moines Independent Community School District
1917 Dean Avenue
Des Moines, IA 50316
EMAIL: douglas.ohde@dmschools.org (Emailed quotes permissible)
FAX: 515-265-8702 (Faxed quotes permissible)

SUBMITTED BY: ____________________________
Name of Bidder

Des Moines Independent Community School District:

The undersigned has examined the quote documents and hereby proposes and agrees to furnish and provide all products, materials, transportation, and services as required for the expeditious completion of the Work required in conformity with this quote request.

The undersigned agrees that the quote, if accepted by the Owner, will be the basis for a purchase order with the Owner.

The quote includes the required bonds and insurance coverage. The Contactor will provide the executed Acknowledgement and Certification form at the time the purchase order is completed.

The undersigned further acknowledges the following Addenda:

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<th>NO.</th>
<th>DATE</th>
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KING PARKING EXPANSION – QUOTE NO. Q6747

The undersigned proposes to provide the scope of work as specified for the lump sum price of:

$_____________________

F.O.B. DESTINATION EXCLUDING ALL TAXES. (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern).

SCHEDULE – In compliance with the scope of work.

The bidder is ( ) or is not ( ) an Iowa resident bidder as defined in Section 73A.21 of the Iowa code. If not a resident bidder, the bidder states that it is a non-resident bidder from the state of ______________. This state does ( ) or does not ( ) provide for a bidder preference for resident bidders. This state does ( ) or does not ( ) provide a labor preference for resident labor. If the state in which your company is a resident allows for either a bidder preference or a labor preference, please provide the citation to the code section, and the details of each preference allowed in your resident state.
SUBMITTED BY: ________________________________
Name of Bidder

Address: ____________________________________________________________________________

Phone # ___________________________       Fax # _______________________________

Email address ________________________________

________________________________________
(Authorized Signature)

Contractor’s License Number __________________________

Date of Expiration: __________________________
If bidder is awarded the contract for this project, the bidder proposes for owner approval the award of a subcontract to the following certified Iowa TSB's:
(if more room is needed, supply same information on second sheet and attach to this form)

<table>
<thead>
<tr>
<th>TSB Company Name</th>
<th>Address</th>
<th>Description of Work</th>
<th>Dollar Amount</th>
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<tbody>
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<td>1.</td>
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<td>2.</td>
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<tr>
<td>3.</td>
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</tbody>
</table>

Bidder's Company Name  Telephone No.
Address  City  State  Zip
Signature (Same person who signs proposal)  Title

**THIS STATEMENT MUST BE NOTARIZED.**

STATE OF _______________,  ________________ COUNTY, ss:

Subscribed and sworn to before me by the said __________________________ on this day of _____________, 201_.

Notary Public in and for the State of ____________

**Bidders to supply all the following information**

Bidder is _____ / is not _____ a certified Iowa Targeted Small Business, (TSB).
If bidder did not contact any certified Targeted Small Businesses, then state why:

**The following TSB's were contacted and declined to participate:**
(If more room is needed, supply same information on second sheet and attach to this form)

1. 
   TSB Company Name
   Address
   Contact Name
   Date Contacted
   Telephone No.

   Reason given for declining participation

2. 
   TSB Company Name
   Address
   Contact Name
   Date Contacted
   Telephone No.

   Reason given for declining participation

3. 
   TSB Company Name
   Address
   Contact Name
   Date Contacted
   Telephone No.

   Reason given for declining participation

4. 
   TSB Company Name
   Address
   Contact Name
   Date Contacted
   Telephone No.

   Reason given for declining participation
The Contractor and/or the sub-contractors, as applicable, shall provide this affidavit:

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH QUOTE.

State of Iowa  )
             ) ss.
County of Polk )

being first duly sworn, deposes and says that he or she

(Name) is _________________________________________  of                       ,
(Title)       (Contractor)

the party making the foregoing bid that the bid is not made in the interest of, or on the behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereto to effectuate a collusive or sham bid."

The undersigned certifies under penalty of perjury that the foregoing is true and correct;

THIS STATEMENT MUST BE NOTARIZED.

NAME OF CONTRACTOR: _____________________________________________

BY: ____________________________  __________________________
     Signature               Title

Type/Print Name       Date

STATE OF __________________,   COUNTY, ss:

Subscribed and sworn to before me by the said _____________________, on this
day of ____________, 201_.

Notary Public in and for the State of ________
ACKNOWLEDGMENT AND CERTIFICATION

[company] is providing services to the Des Moines Public School District (“District”) as a vendor, supplier, contractor or subcontractor and/or is operating or managing the operations of a vendor, supplier or contractor. The services provided by the [company] may involve the presence of the [company]’s employees upon the real property of the schools of the District.

The [company] acknowledges that Iowa law prohibits a sex offender who has been convicted of a sex offense against a minor from being present upon the real property of the schools of the District. The [company] further acknowledges that, pursuant to law, a sex offender who has been convicted of a sex offense against a minor may not operate, manage, be employed by, or act as a contractor, vendor or supplier of services or volunteer at the schools of the District.

The [company] hereby certifies that no one who is an owner, operator or manager of the [company] has been convicted of a sex offense against a minor. The [company] further agrees that it shall not permit any person who is a sex offender convicted of a sex offense against a minor to provide any services to the District in accordance with the prohibitions set forth above.

This Acknowledgment and Certification is to be construed under the laws of the State of Iowa. If any portion hereof is held invalid, the balance of the document shall, notwithstanding, continue in full legal force and effect.

In signing this Acknowledgment and Certification, the person signing on behalf of the [company] hereby acknowledges that he/she has read this entire document, that he/she understands its terms, and that he/she not only has the authority to sign the document on behalf of the [company], but has signed it knowingly and voluntarily.

Dated: ____________________________

[company]

By: ____________________________

Printed Name: ____________________________

Title: ____________________________
DMPS INSURANCE REQUIREMENTS

Insurance by Contractor

The Contractor shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of or result from the Contractor’s operations under the Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. All such insurance shall be subject to the approval of the District for adequacy of protection, and shall include a provision preventing cancellation without thirty (30) days’ prior notice to the District in writing.

Commercial General Liability Insurance

<table>
<thead>
<tr>
<th>Type of Coverage</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Each Occurrence</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Damages to rented premises (each occurrence)</td>
<td>$200,000</td>
</tr>
<tr>
<td>Medical Expenses (any one person)</td>
<td>$10,000</td>
</tr>
<tr>
<td>Personal Injury</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>General aggregate</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Products Complete Aggregate</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

Automobile Insurance

<table>
<thead>
<tr>
<th>Type of Coverage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined single limit</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

Worker’s Compensation Insurance

In accordance with the laws of the State of Iowa covering all employees who perform any obligations assumed under the contract.

<table>
<thead>
<tr>
<th>Type of Coverage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each accident – minimum</td>
<td>$500,000</td>
</tr>
<tr>
<td>Disease – minimum each employee</td>
<td>$500,000</td>
</tr>
</tbody>
</table>

Upon selection, contractor will present certificates of insurance to the Des Moines Independent Community School District showing compliance with the forgoing requirements.
LABOR AND MATERIAL PAYMENT BOND
Bond No. _____________

This Bond is issued simultaneously with a Performance Bond in favor of the Owner conditioned on the full and timely performance of the Contract.)

KNOW ALL MEN BY THESE PRESENTS that ________________________________

___________________________________________________as Principal (the “Principal”), and
_____________________________________________________________________________, a corporation organized and existing under the laws of the State of _________________, and authorized to transact business in the State of Iowa, as Surety (the “Surety”), jointly and severally bind themselves, their heirs, personal representatives, successors, and assigns, to the DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT, 901 Walnut Street, Des Moines, Iowa 50309, as Obligee (the “Owner”), for the use and benefit of it and the claimants as defined below, in the principal amount of

___________________________________________________________ ($____________________) as adjusted by approved change orders (not to exceed 10 percent of the principal amount of this Bond unless expressly approved by the Surety, which approval shall not be unreasonably withheld) and interest as provided by law, for the payment of all amounts which become due under the Contract described below.

The Principal and the Owner have entered into a written Construction Agreement dated ________________, 201_, together with related “Contract Documents” as defined therein (all of which are collectively referred to as the “Contract” and incorporated herein by this reference), for the following Project:

______________________________________________________________________________
______________________________________________________________________________

The condition of this obligation is such that, if the Principal shall at all times promptly make payment of all amounts, claims, or demands lawfully due to all persons, firms, associations, or corporations supplying or furnishing to the Principal or its subcontractors labor or materials, supplies, or equipment which are used, provided, or performed in the prosecution of the work provided for in the Contract and any and all duly authorized modifications of the Contract that may hereafter be made, then this obligation shall be null and void; otherwise, the Surety shall pay the full value of all such claims or demands and shall indemnify and hold the Owner harmless from all payments which the Owner may be required to make under the Contract or applicable law in excess of the Contract price not exceeding the amount of this obligation, together with interest as provided by law, as well as attorneys’ fees and costs incurred by the Owner in the resolution of any claim. All such subcontractors, laborers, and materialmen shall have rights under the within Bond as are set forth in the statutes and laws of the State of Iowa.

Further, each and every claimant, who institutes a lawsuit for compensation or payment under the terms payment under the terms hereof, as part of any court award, shall be entitled to reasonable attorneys’ fees and costs.

The undersigned Surety for value received hereby agrees that no extension of time, change in, addition to, or other modification of the terms of the Contract or work to be performed thereunder, or of the March 16, 2001
specifications, or of the Contract Documents, shall in any way affect its obligation on this Bond and the Surety hereby waives notice of any such extension of time, change, addition, or modification.

Any notice which any party desires or is required to provide another shall be in writing and shall be effective upon receipt when delivered or transmitted by personal delivery, certified (return receipt) mail, or express mail service to the addresses set forth herein.

IN WITNESS WHEREOF, said Principal and Surety have executed this Bond, this ______ day of ______________________, 20______.

ATTEST: __________________________________________
Principal

By: __________________________________________
Address: ______________________________________
(SEAL) _______________________________________

ATTEST: __________________________________________
(Surety)

By: __________________________________________
Address: ______________________________________
(SEAL) _______________________________________

Claims Telephone Number: _________________________
Claims Fax Number: _______________________________

The fully executed Bond form must be accompanied by a current Power of Attorney.

END OF DOCUMENT
DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT
KING PARKING EXPANSION

PERFORMANCE BOND
Bond No. _____________

KNOW ALL MEN BY THESE PRESENTS
That___________________________________________________________, as Principal (the “Principal”), and __________________________________________________________________, a corporation organized and existing under the laws of the State of ______________, and authorized to transact business in the State of Iowa, as Surety (the “Surety”), jointly and severally, bind themselves, their heirs, personal representatives, successors, and assigns to the DES MOINES INDEPENDENT COMMUNITY SCHOOL DISTRICT, 901 Walnut Street, Des Moines, Iowa 50309, as Obligee (the “Owner”), in the principal amount of ___________________________________________________________ ($__________ ___________ ) as adjusted by approved change orders (not to exceed 10 percent of the principal amount of this Bond unless expressly approved by the Surety, which approval shall not be unreasonably withheld) and interest as provided by law (collectively referred to herein as the “Penal Sum”), for the performance of the Construction Agreement between the Principal and the Owner, dated ________________________________, 201__, for the following (Project):

____________________________________________________________

____________________________________________________________

together with the obligations of the Contract Documents, as defined in the Construction Agreement, all of which documents are collectively referred to herein as the "Contract" and are incorporated by this reference.

The condition of this obligation is such that, if the Principal shall at all times duly, promptly, and properly perform all the terms and conditions of the Contract and any authorized modifications thereof during the original term of the Contract, any extensions thereof that may be granted by the Owner, and during the term of any guarantee or warranty required under the Contract, the Principal and Surety shall have no obligation under this Bond, otherwise it shall remain in full force and effect.

The Surety for value received agrees that no extension of time, change in, addition to, or other alteration or modification of the terms of the Contract or work to be performed thereunder, or any other forbearance on the part of either the Owner or the Principal to the other shall in any way release or affect the Surety's liability or obligation on this Bond, and the Surety hereby waives notice of any such extension of time, change, addition, modification, alteration, or forbearance.

Whenever the Owner terminates the Contract in accordance with the terms thereof, the Surety shall, within fifteen (15) calendar days after written notice of such termination, notify the Owner in writing of its election to complete the Contract in accordance with its terms, or notify the Owner that the Surety elects not to complete the Contract. If the Surety fails to give the written notice so required within such fifteen (15) calendar day period, then it will be deemed to have elected not to complete the Contract. Should the Surety elect to complete the Contract, then it shall, within fifteen (15) additional calendar days following written notice of such election, obtain a contractor, subject to approval by the Owner in writing, to complete the original Contract in accordance with its terms and conditions and thereafter proceed with the work with due diligence and make

March 16, 2001
available as the work progresses sufficient funds to pay the cost of completion less the balance of the Contract price. The Surety may not engage the Principal to complete the Contract, without the prior written consent of the Owner, which consent may be withheld in the Owner's sole discretion. If the Surety elects to complete the Contract, then it shall be entitled to receive the balance of the Contract price, less (i) any amounts paid by the Owner to the Principal; (ii) costs incurred by the Owner in correcting any defective work; (iii) any additional legal, design professional, and other costs incurred by the Owner resulting from the Principal's default; and (iv) liquidated damages caused by delayed performance or nonperformance of the Principal. Any progress payments, less retainage, due but not paid at the date of termination shall be paid to the Surety so long as the Surety has agreed to indemnify the Owner for the amount thereof and no other claims have been made to such funds by subcontractors or suppliers in accordance with the Contract or applicable law.

In the event the Surety elects not to complete the Contract, the Owner may then have the work completed by such means and in such manner, by contract with or without public bidding, or otherwise, as it may deem advisable. The Surety in such event shall at all times make available, as work progresses under the Contract between the Owner and its new contractor, sufficient funds, not to exceed the Penal Sum, to pay the cost of the completion of the Contract pursuant to its terms, together with the other amounts set forth in (i) through (iv) above, but in no event shall the Surety be responsible for the payment of any sums to the Owner until the Owner has paid in full its total obligation under the terms of the original Contract, plus change orders, less deductions and claims chargeable by law or by the Contract, if any, and less the retainage which will be disbursed as provided by the Contract Documents and applicable law.

The procedures set forth herein shall apply should there be a default and termination or a succession of defaults and terminations in fulfilling the terms and conditions of the work under the original Contract.

In the event there are negotiations between the Principal and/or the Surety and the Owner subsequent to the date of termination, each party shall appoint an authorized representative with authority to represent it during the negotiations. All written communications and official discussions between the parties shall be conducted by these authorized representatives. Any notice which any party desires or is required to provide another shall be in writing and shall be effective upon receipt when delivered or transmitted by personal delivery, certified (return receipt) mail, or express mail service to the addresses set forth herein.

Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work is located and shall be instituted before the expiration of three (3) years from the date on which final payment under the contract is made; provided, however, that this period may be extended by one (1) additional year by the Owner's giving written notice to the Surety within the three (3) year period of a potential claim. Any judgment recovered hereunder by the Owner shall include interest at the legal rate, together with reasonable attorneys' fees and costs.
No right action shall accrue under this Bond to or for the use of any person or entity other than the Owner or its successors and assigns.

IN WITNESS WHEREOF, the Principal and Surety have signed this Performance Bond as of the __________ day of __________________, 201__.

ATTEST:

Principal

By: ________________________________
Address: ________________________________
(SEAL) ________________________________

ATTEST:

(Surety)

By: ________________________________
Address: ________________________________
(SEAL) ________________________________

Claims Telephone Number: __________________
Claims Fax Number: __________________

The fully executed bond form must be accompanied by a current Power of Attorney.

END OF DOCUMENT
CONSTRUCTION SPECIFICATIONS
for
MARTIN LUTHER KING JR ELEMENTARY SCHOOL
SITE IMPROVEMENT PLAN

DES MOINES INDEPENDENT COMM. SCHOOL DISTRICT
DES MOINES, IA

May 10, 2013
(Bishop Engr. PN 130066)

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<th>Section</th>
<th>Title</th>
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<tr>
<td>02230</td>
<td>Site Clearing</td>
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<tr>
<td>02300</td>
<td>Earthwork</td>
</tr>
<tr>
<td>02751</td>
<td>Concrete Paving</td>
</tr>
<tr>
<td>02764</td>
<td>Pavement Joint Sealants</td>
</tr>
<tr>
<td>02766</td>
<td>Pavement Markings</td>
</tr>
<tr>
<td>02920</td>
<td>Sodding</td>
</tr>
<tr>
<td>02923</td>
<td>Landscape Grading</td>
</tr>
</tbody>
</table>

Bishop Engineering
3501 104th St.  Des Moines, IA  50322
SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this Section.

1.02 SUMMARY:

A. This section includes the following:

1. Protection of existing trees.
2. Removal of Trees and other Vegetation.
3. Clearing and Grubbing.
4. Removing above-grade improvement.
5. Removing below grade improvements.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

A. Division 2 Section "Earthwork."

1.04 SUBMITTALS

A. General: Submit the following Schedule (item B) in accordance with Conditions of the Contract and Division 1 Specifications Section.

B. Schedule indicating proposed sequence of operations for selective demolition work to Owner's Representative for review prior to start of work.

1.05 PROJECT CONDITIONS:

A. Traffic: Conduct site demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

B. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinnning of roots, skinnning or bruising of bark, smothering trees by stockpiling construction materials or
excavated materials with drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fencing to protect trees and vegetation as instructed on drawings.

C. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

D. Environmental Controls: Comply with governing regulations pertaining to environmental protection.
   1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

E. If unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure both nature and extent of conflict. Submit report to Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

F. Salvageable Improvements: Carefully remove items indicated to be salvaged, and store on owners premises where indicated or directed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 DEMOLITION:
   A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
      1. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

3.02 SITE CLEARING:
   A. General: Remove trees, shrubs, grass, and other vegetation, improvements or obstructions as required to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated.
      1. Removal includes digging out and off-site disposing of stumps and roots.
      2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner, where such roots and branches obstruct installation of new construction.
B. Clearing and Grubbing: Clear sites of trees, shrubs and other vegetation, as indicated on the plans. Strip site to a minimum depth of 6 inches.

1. Completely remove stumps, roots, and other debris protruding through ground surface.
2. Use only hand methods for grubbing inside dripline of trees indicated to remain.
3. Fill depressions caused by clearing and grubbing operations with satisfactory soil materials, unless further excavation of earthwork is indicated.
   a. Compact fill material in accordance with requirements of Section 02300 Earthwork.

C. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated on drawings.

3.03 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose of 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.

3.04 CLEAN UP AND REPAIR:

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections:

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start of operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02230
SECTION 02300 - EARTHWORK

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 work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Extent of Earthwork is indicated on Drawings.

B. Work includes:

1. Stripping, topsoil stockpiling.
2. Excavation.
3. Fill.
4. Compaction.
5. Preparation of subgrade for walls, parking and drives, and steps and walks.
7. Topsoil placement.
8. Finish grading.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Division 2 Section “Site Clearing.”

B. Division 2 Section “Landscape Grading.”

1.04 QUALITY ASSURANCE

A. Codes and Standards:

1. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
2. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

B. Testing and Inspection Service:
1. Cost of field and laboratory testing will be borne by the Owner. Testing by laboratory approved by the Owner and Engineer.
2. Contractor will cooperate with testing laboratory and geotechnical Engineer in coordinating compaction testing, installation and protection of settlement monitoring devices.

1.05 SUBMITTALS

A. Testing Reports - Excavating: Submit the following reports directly to the Engineer from the testing services, with copies to the Contractor and the Owner.

1. Test reports on borrow material/lab analysis of fill materials.
2. Verification of each footing subgrade (material and unconfined compressive strength).
3. Field density test reports.
4. One optimum moisture-maximum density curve for each type of soil encountered.
5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.06 JOB CONDITIONS

A. Soil Borings:

1. Test borings and other exploratory operations may be made by Contractor at no cost to Owner with Owner approval.

B. Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
2. Underground utilities shown on the drawings have been taken from existing public records, Owner's records and available as-built drawings and are correct to the best of our knowledge and provided for information only.
3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities caused by Contractor's negligence to the satisfaction of utility owner at no cost to the Project Owner.
4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided.
5. Provide minimum of 48-hour notice to Owner and Engineer and receive written notice to proceed before interrupting any utility.
6. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

C. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.
2. Operate warning lights as recommended by authorities having jurisdiction.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS/DEFINITIONS

A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups CL, GC, GW, CP, GM, ML, SC, SM, SW, and SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups MG, DH, OL, OH, PT and any bedrock material.

C. Subbase material (granular fill): Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.

D. Fill materials:

1. The fill material type shall be cohesive, non-expansive soil having a "CL" or "CL-ML" classification in accordance with the Unified Soil Classification System and shall have a maximum laboratory dry density (100%) of 100 pounds per cubic foot or more as determined by ASTM D698 (Standard Proctor).
2. No organic dark colored soils or plastic and potentially expansive soils, such as clay shale, are considered suitable engineered fill materials. Topsoils should be sorted and stockpiled for landscaping purposes.
3. When fill material includes rock, the maximum rock size acceptable shall be three inches (3"). No large rocks shall be allowed to rest and all voids must be carefully filled with small stones or earth, properly compacted. No large rocks will be permitted within twelve inches (12") of the finished grade.

E. Topsoil: Secure and stockpile from naturally well drained areas during stripping operations; use satisfactory soil materials free of admixture of subsoil, reasonably free from clay lumps, stone or other debris a greater than 1-1/2" in diameter.
F. Erosion Fence: Three (3) foot wide, 10 mil., 100 percent spunbonded nylon reinforced silt fence fabric with a maximum vertical water flow of 500 gallons per minute per square foot. Posts shall be steel T posts, minimum length 5 foot.

G. Straw Bales: Bound, rectangular, straw bales and suitable stakes. Straw bales to be in good condition. Loose, broken or deteriorated bales will not be accepted.

PART 3 - EXECUTION

3.01 EXCAVATION

A. Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

B. Unauthorized Excavation:

1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
2. Unauthorized excavation, as well as remedial work directed by Engineer shall be at Contractor's expense.
3. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Engineer.

C. Additional Excavation:

1. When excavation has reached required subgrade elevations, notify Engineer who will make an inspection of conditions. Engineer shall evaluate and advise if bearing material is suitable and shall provide unconfined compressive strength tests.
2. If unsuitable bearing materials are encountered at required elevations, carry excavations deeper and replace excavated material with engineered compacted backfill as directed by Engineer.
3. Unsuitable soil shall be removed 2'-0" minimum from beneath the footing level and shall be reinstalled at a width 2.5 times the footing width as indicated on the drawings. This area shall be refilled with compacted crushed stone to 98 percent standard proctor D698 (70 percent relative density D2049).
4. Removal or reworking of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

D. Stability of Excavations:

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

E. Dewatering:

1. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
2. Do not allow water to accumulate in excavations.
3. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.
4. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
5. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas.
6. Do not use trench excavations as temporary drainage ditches.

F. Material Storage:

1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill.
2. Place, grade and shape stockpiles for proper drainage.
3. Locate and retain soil materials away from edge of excavations.
4. Do not store within drip line of trees indicated to remain.
5. Dispose of excess soil material and waste materials as herein specified.

G. Subgrade Preparation: Paving systems:

1. Provide a minimum 12" compacted depth subgrade for paving, plus fill as required.
2. Scarify, mix and recompose materials to provide uniform composition at least 12" below top of subgrade for paving for full width of subgrade plus 2'-0" on each side of asphalt paving.
3. Construct 12" thick uniform subgrade by excavating top 6" of subgrade, scarifying, mixing, and recomposing next 6" of subgrade and then replacing top 6" of subgrade and recomposing.
4. Proof roll existing soils prior to placing fill to determine location of unsuitable bearing materials. Notify Engineer if unsuitable conditions are encountered for direction.
5. Compact as per Paragraph 3.2 Compaction requirements.

3.02 COMPACTION

A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
B. Compaction Requirements: Compact top 12" of subgrade and each layer of backfill or fill material to not less than the following percentages of maximum density:

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>Standard Proctor ASTM D698</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building, foundation, recreation field subgrade walls, roadway, parking lot and critical backfill area beneath same; e.g. trenches</td>
<td>95%</td>
</tr>
<tr>
<td>Backfill adjacent to structures not supporting other structures - minor subsidence possible.</td>
<td>95%</td>
</tr>
<tr>
<td>Lawn areas. Non-critical areas - moderate subsidence possible.</td>
<td>90%</td>
</tr>
</tbody>
</table>

*Use relative density technique (ASTM D4253 and D4254) where standard proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.

C. Moisture Control and Content:

1. When 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.
4. The fill material shall be compacted at a moisture content typically within a range of minus two percent to plus four percent (-2% to +4%) of optimum moisture content as determined by ASTM D698 (Standard Proctor). Other acceptable moisture content ranges determined by the Engineer may be necessary to produce desirable results with specific soils.
3.03 BACKFILL AND FILL

A. General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material. Site strippings (per soils report) are not to be used as satisfactory excavated material.
2. Under grassed areas, use satisfactory excavated or borrow material.
3. Under walks and pavements, use subbase material or satisfactory scarified and recompacted subgrade or borrow material, or combination of these.
4. Under steps, use subbase material.
5. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 degrees of cylinder.

B. Ground Surface Preparation:

1. Clearing area to be filled: All timber, logs, trees, brush and rubbish shall be removed or otherwise acceptably disposed of.
2. Scarifying area to be filled:
   a. All vegetable matter and dark colored organic soil shall be removed from the surface upon which the fill is to be placed (per soils report) and the surface shall be plowed or scarified to a depth of at least 12 inches and until the surface is free from ruts, hummocks or other uneven features which would tend to prevent uniform compaction by the equipment to be used.
   b. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed or scarified deeply or where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Engineer.

3. Compaction area to be filled: After the foundation for the fill has been cleared and plowed or scarified, it shall be disked or bladed until it is uniform and free from large clods, brought to within the specified moisture content range and compacted to not less than ninety-five percent (95%) of maximum dry density in accordance with current ASTM D698 (Standard Proctor).

C. Placement and Compaction:

1. Depth and Mixing of Fill Layers: The selected fill material shall be placed in level, uniform layers which, when compacted, shall have a density conforming to a minimum of ninety-five percent (95%) of maximum dry density in accordance with ASTM D698 (Standard Proctor). Each layer shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer. Compacted layer thickness will be compatible with the demonstrated compatibility of the compaction equipment being used, with a compacted layer thickness of 6" considered typical.
2. Amount of Compaction: After each layer (lift) has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of ninety-five percent (95%) of the material's maximum dry density as determined by ASTM D698 (Standard Proctor) for areas supporting building foundations and floor slabs. Grassed areas or areas not supporting buildings or slabs-on-grade should be compacted to a minimum of ninety percent (90%).

3. Compaction of Fill Layer: Compaction equipment shall be of such design to be able to compact the fill to the specified density. Compaction shall be accomplished while the fill material is within the specified moisture content range. Compaction of each layer shall be continuous over its entire area and the compaction equipment shall make sufficient trips to insure that the required density has been obtained.

4. Compaction of Slopes: Fill slopes shall be compacted. Compacting operations shall be continued until the slopes are stable but not too dense for planting on the slopes. Compacting of the slopes may be done progressively in increments of three to five feet (3' to 5') in fill height or after the fill is brought to its total height.

5. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3.04 GRADING

A. General:

1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.

2. 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 Paving Lines:

1. Grade areas to adjacent to paving lines to drain away from structures and to prevent ponding.

2. Finish surfaces free from irregular surface changes, and as follows:

   a. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10' above or below required subgrade elevations.

   b. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.

C. Grading Surface of Fill Under Paving & Recreational Fields (coordinate with field specs):

1. Grade smooth and even, free of voids, compacted as specified, and to required elevation.

2. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.
D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.05 EMBANKMENTS

A. General: Prepare site, place and compact excavated materials to required elevation and cross section.

B. Construction:

1. Construct embankment in horizontal layers not more than 6” in loose thickness.
2. Deposit each layer over full width of embankment as separate and distinct operation.
3. After layer is deposited, smooth to uniform depth by means of suitable motor patrol or bulldozer.
4. Compact layer by rolling with tamping type roller until full weight of roller is supported by tamping feet, but with not less than one pass per inch of loose thickness of layer.
5. Roller will be considered to be supported entirely on its tamping feet when feet do not penetrate more than 3" into material being compacted.
6. If soil is wet so that it will not sufficiently compact by one passing of roller per inch of loose thickness, provide one discing per 2" of loose thickness.
   a. Cut and stir full depth of layer.
   b. Allow interval of not longer than two hours between successive discings, or as directed by Engineer.
   c. After discing is completed compact layer by specified rolling.

7. If soil is dry so that it will not satisfactorily compact by rolling, moisten material before compaction; manipulate material to secure proper distribution of moisture before compaction.
8. Whenever operations are suspended during periods rain is likely to occur, smooth and compact surface to shed water readily.
9. Compact to not less than 95% maximum density with moisture content not more than three percentage points above or below optimum; maximum density determined by ASTM D698.

3.06 TOPSOIL SPREADING

See Division 2 Section “Landscape Grading.”

3.07 FINISH GRADING

See Division 2 Section “Landscape Grading.”
3.08 MAINTENANCE

A. Protection of Graded Areas:
   1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
   2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
   3. Keep public streets clean from soil, soil tracking and debris at all times.

B. Reconditioning Compacted Areas: Where completed graded areas are disturbed by subsequent construction operations, erosion or adverse weather, scarify surface, re-shape and compact to required density prior to further construction.

C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.09 EROSION PROTECTION

A. The Contractor shall comply with soil erosion control requirements of the Iowa Code, and the local ordinances. The Contractor shall take all necessary measurements to protect against erosion and dust pollution on this project site and all off-site borrow or deposit areas, during performance or as a result of performance.

B. The Contractor shall take all steps necessary to protect adjoining property, including public sanitary and storm drainage systems and streets, from any damage resulting from the movement of earth or other debris thereto from the site; and such steps as are necessary to prevent the accumulation of earth or debris on adjoining public or private property from the construction site. The Contractor shall take into consideration all factors which might cause the movement of earth or debris from the construction site onto any adjoining public or private property.

C. The Contractor shall take immediate corrective action should damage occur to adjoining public or private property (including sanitary or storm drainage systems and streets). The Contractor shall take immediate corrective action to remove any debris should any earth or other debris move from the construction site to adjoining public or private property. Further, the Contractor shall take steps required to prevent the repetition of any instance where dirt or other debris moves from the construction site to adjoining public or private property.

D. The Contractor will hold the Owner harmless from any and all claims of any type whatsoever resulting from damages to adjoining public or private property, including reasonable attorney's fees incurred to Owner. Further, if the Contractor fails to take necessary steps to promptly remove earth or debris which comes onto adjoining public or private property, the
Owner may, but need not, remove such debris and deduct the cost thereof from amounts due the Contractor.

E. The Contractor shall maintain storm sewer systems throughout construction and provide erosion control measures acceptable to protect against siltation and erosion or any adverse conditions resulting from storm water. Use straw bales and other means at all intakes and outfall structures and at all locations where erosion or siltation is anticipated or occurring; including drainage courses and swales.

F. Silt fences shall be installed as shown on drawings, in locations as directed by Engineer, and in locations as required by Contractors erosion control plan.

1. Drive T-posts 5' O.C. in drainage swales, 8' O.C. for slope control, to a minimum depth of 2 1/2'. Attach fabric to posts with continuous cord or wire. Bury 12" of fabric in continuous trench in front of posts.
2. Contractor to routinely inspect condition of fences and repair and clean, as necessary to maintain them in good working order.
3. After vegetative cover is established, silt fences will be removed by Contractor and disposed of off site.

3.10 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction:

1. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.
2. Perform field density tests in accordance with ASTM D2922 (nuclear method) or ASTM D1556 (sand cone method), as applicable.
3. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test every 50 lineal feet to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Engineer.
4. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 2000 sq. ft. of paved area, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2000 sq. ft. of overlaying building slab or paved area, but in no case less than 3 tests.
5. If, in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

3.11 NATURAL AND ARTIFICIAL DRAINAGE

A. If necessary during the progress of the work to interrupt the natural drainage of the surface water, Contractor shall provide approved temporary drainage facilities.
B. If necessary to interrupt any field tile drains that might be encountered in this work, the Contractor shall restore or extend drains as necessary. Payment for this work will be on the basis of contract conditions relative to changes in work.

3.12  DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash and debris from site to an approved location for disposal by Contractor.

B. All excess excavation shall be removed from the site unless otherwise directed by the Owner.

END OF SECTION 02300
SECTION 02751 - CONCRETE PAVING

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

   A. Drawings and General Provisions of Contract, including Bidding Requirements, General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.

   B. Comply with ACI 316 "Recommended Practice for Construction of Concrete Pavements and Concrete Bases" for all work.

1.02 WORK INCLUDED:

Provide all labor, materials, equipment and supervision required to construct concrete curbs, walks, steps, parking lots, edging, etc. including:

   A. Concrete.

   B. Curing and sealing.

   C. Contraction and expansion joints and fillers.

   D. Vapor barrier.

   E. Sleeves.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

   A. See Division 2 Section “Earthwork”

1.04 QUALITY ASSURANCE:

   A. Cost of field and laboratory testing will be borne by the Owner. Testing by laboratory approved by the Owner. Lab reports shall be simultaneously forwarded to the Owner, Contractor and Engineer.

   B. Testing:
1. Slump to be checked in accordance with ASTM C143. One test minimum per hour.
2. Air content measured in accordance with ASTM C231, or C173. One test minimum daily.
3. Strength tests:
   a. Take three (3) cylinders for each one hundred fifty (150) cubic yards or part thereof. Minimum one set of three (3) cylinders per each day’s pour.
   b. Each cylinder shall be plainly marked showing cylinder designation (1A, 1B, 1C).
   c. Job cure each cylinder three (3) days.
   d. After three (3) days, send cylinders A and B to the laboratory approved by the Engineer for testing at ages seven (7) days and twenty-eight (28) days. Cylinder C to remain at the job as a "spare" cured under same conditions as concrete in the area from which it was taken.
   e. The date and location of each sample shall be marked on the Contractor’s job set of plans.
   f. Load and cure tests shall be required only if cylinder tests indicate concrete does not meet Specifications. Such tests, if deemed advisable by the Engineer, shall be arranged and paid for by the Contractor.

1.05 SUBMITTALS:
A. Certification of concrete C-4 design mix with Class 3 durability aggregate by a testing laboratory. Submit prior to placement.
B. Submit plan for construction sequence and schedule prior to commencing construction.

1.06 CODES, PERMITS AND FEES:
A. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

1.07 SITE DISTURBANCES:
A. Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, drives, utilities, plants, etc.
B. Verify locations and depths of all underground utilities prior to excavation.
C. Repair and/or return to original condition any damage caused by Contractor’s negligence at no cost to Owner.
D. Provide temporary barricades and warning lights as required for protection of project work and public safety.

1.08 RESTRICTIONS ON OPERATIONS

A. Weather Conditions:

1. Do not place concrete when stormy or inclement weather or temperature prevents good workmanship. Aggregates containing frozen lumps shall not be placed, and concrete shall not be placed on a frozen subgrade or subbase. The contractor will take all necessary actions to prevent the pavement from freezing.

   a. Concrete placement may commence if the concrete mix temperature is a minimum of 40° and the air temperature is:

      1) After November 15, the air temperature is 36° and rising.
      2) After April 15, the air temperature is 32° and rising.

   b. Concrete placement will stop when:

      1) After November 15, the air temperature is 37° and falling.
      2) After April 15, the air temperature is 32° and falling.
      3) With non-reinforced pavement, calcium chloride may be added to the mixing water to hasten initial set, if approved by Engineer.
      4) Pavement damaged by inclement weather shall be removed and replaced.

   c. For warm weather, restrictions on concrete placement see Section 7010, 1.07, D.

2. Temperature restrictions and protection requirements may be modified by the Engineer under unusual conditions.

B. Cold Weather Temperature Protection:
1. All concrete pavement and curb/gutters, including exposed edges of the slab and curb, shall be cured. In addition, concrete less than 36 hours old shall be protected as follows:

<table>
<thead>
<tr>
<th>Night Temperature Forecast</th>
<th>Type of Protection¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>35°F to 32°F</td>
<td>One layer of burlap for concrete.</td>
</tr>
<tr>
<td>31°F to 25°F</td>
<td>Two layers of burlap or one layer of plastic on one layer of burlap.</td>
</tr>
<tr>
<td>Below 25°F</td>
<td>Four layers of burlap between layers of 4 mil (100 μm) plastic or equivalent commercial insulating material approved by the Engineer.</td>
</tr>
</tbody>
</table>

¹ The protection shall remain until one of the following conditions is met:
  a. The pavement is 5 calendar days old.
  b. Opening strength is attained.
  c. Forecasted low temperatures exceed 35°F for the next 48 hours.
  d. Forecasted high temperatures exceed 55°F for the next 24 hours and subgrade temperatures are above 40°F.

a. Paving operations shall be shut down in time to comply with protection requirements outlined above. In good weather, the header shall be placed at least 45 minutes before sunset. During cold weather, more time must be allowed for finishing and protection. All finishing and covering operations shall be performed prior to darkness. Temperature restrictions and protection requirements may be modified by the Engineer.
b. When the pavement is placed directly on natural subgrade, earth check dams shall be constructed immediately after passage of the slip forms or removal of the forms to prevent water from flowing along the edge of the pavement and undermining the slab. They shall not be spaced or be of a width to provide an approach over which a vehicle may be driven onto the pavement.
c. Equivalent commercial insulating material approved by the Engineer may be used. This material shall be waterproof and have a minimum R value of 0.50. If initial set has not yet occurred, a layer of burlap shall be placed on top of concrete prior to placing insulating blankets.
d. Vertical edges of pavement and back of curbs shall be cured by the same method used for curing the surface.
e. Method of protection and materials used shall maintain the concrete above 40°F.

C. Concrete Evaporation Protection:

1. Hot weather condition is defined as any combination of the following conditions that tend to impair the quality of plastic concrete by accelerating the rate of moisture loss and rate of cement hydration causing thermal shrinkage and resulting in plastic shrinkage cracking or crazing.
   - High Ambient Temperature
   - High Wind Velocity
2. Concrete evaporation protection will be based on the theoretical rate of surface evaporation when it exceeds 0.1 lbs. per square foot per hour. The National Weather Service's maximum air temperature, relative humidity and maximum steady wind velocity without gusts, for the date and the location of the paving pour shall be used for the Theoretical Rate of Evaporation Chart.

Theoretical Rate of Evaporation Chart

3. During hot weather conditions the Engineer may restrict concrete placement to early morning or evening hours.
4. Under hot weather conditions the Contractor will advise the Engineer of the results of the theoretical evaporation rate throughout paving operations.
5. The Contractor shall discontinue with placement of the concrete when the theoretical
evaporation rate exceeds to 0.30 lbs./sq.ft./hr. 
6. The protection practice by the Contractor will be as follows for the evaporation rate greater then 0.1 lbs./sq.ft./hr. 

a. Immediately apply an approved evaporation retarder (Polymers) to the concrete pavement and curbs or increase the application cure to 1.5 times the standard specified rate. 
b. Take special precautions to assure that the forms and subgrade are sufficiently moist or protected to avoid lowering the water content at the pavement/subgrade interface. In hot weather conditions the subgrade should also be moistened the evening before operations. 
c. Assure that the time between placing and curing is minimized and eliminate delays. 
d. Moisten concrete aggregates that are dry and absorptive. 
e. Use a fog spray to raise the relative humidity of the ambient air if there is a delay in immediately applying the curing compound. 
f. Minimize solar heat by shading, wetting or covering concrete chutes or other equipment that comes in contact with plastic concrete. 
g. If shrinkage cracks should appear during finishing the cracks can be closed by striking each side of the crack with a float and refinishing. 

D. Rain Protection: 

1. The Contractor shall have available, near the site of the work, materials for proper protection of the edges and surface of concrete. Protective material may consist of sheets of burlap, or plastic film. Planks or other material with suitable stakes that can be used as temporary forms shall also be on hand. 
2. If initial set has not occurred, contractor shall take every precaution necessary to protect the surface texture of the concrete. 
3. Failure to properly protect concrete shall constitute cause for removal and replacement of defective pavement, if so determined by the Engineer. 

E. Repair of Pavement: 

1. The Contractor shall protect the new pavement and its appurtenances from traffic, both public and that caused by its own employees and agents, at its expense. This includes the erection and maintenance of warning signs, lights, barricades, watchmen to direct traffic, and pavement bridges or crossovers. 
2. Any part of the pavement damaged by traffic or other causes occurring prior to final acceptance of the pavement shall be repaired or replaced, at the discretion of the Engineer, at the Contractor's expense. 
3. The Contractor shall not operate equipment with metal tracks, metal bucket blades, or metal motor patrol blades directly on new paving. The Contractor shall not unload soil or granular materials, including base rock for storage and future reloading directly onto new paving. 

F. Use of Pavement: Time for opening pavement for use is determined by age or by test results from cylinder or beams taken during placement.
PART 2 - PRODUCTS

2.01 CONCRETE STRENGTH:

A. Concrete mix for exterior slabs and steps:

   1. Minimum of 4000 psi compressive strength at twenty-eight (28) days.
   2. Minimum air content of 6.0%. To allow for loss during placement, the air content of fresh, un-vibrated concrete shall be 7.0%.
   3. Maximum of 15% replacement of cement with fly ash will be permitted.
   4. Slump four inches (4") maximum.

2.02 MIXING:

A. Except as otherwise specified, concrete shall be ready-mixed or job-mixed at the Contractor's option, and in accordance with requirements of ACI 318-77. Ready-mixed concrete shall be mixed and delivered to the project in accordance with ASTM C94. Maximum mixing time is one (1) hour.

2.03 PORTLAND CEMENT:

A. ASTM C150, type I.
2.04 SAND:
   A. Clean, hard, washed and well graded. Sand shall conform with ASTM C33.

2.05 COARSE AGGREGATE:
   A. Aggregate shall conform to ASTM C33. Aggregate for footings and other unexposed concrete may be gravel. Aggregate for exterior concrete and surfaces shall be limestone (max. size 1"). No substitutions will be allowed. Evidence of staining due to impurities will be cause for rejection of work.

2.06 MIXING WATER:
   A. Clean and free from oil, acid and injurious amounts of vegetable matter, alkalies and other impurities.

2.07 ADMIXTURES:
   A. Air entrainment: 6%, + 1% or -0.5%.
   B. Air-entraining agents shall conform to ASTM C260.
   C. Calcium Chloride is not to be used. No other admixtures shall be used without the expressed, written consent of the Engineer.
   D. A water-reducing agent may be used as deemed necessary, to be in conformance with the latest ASTM requirements.

2.08 EXPANSION JOINT FILLERS:
   A. Polyethylene closed cell foam expansion joint filler. Sonoflex F or equivalent.

2.09 EXPANSION JOINT SEALANT:
   A. Shall be Sonneborn products Sonolastic SL-1. Pour-type self-leveling polyurethane or gun grade polyurethane compatible with foam expansion joint filler. Color = Gray.

2.10 CURE AND SEAL:
A. CS-309 W.R. Meadows, Inc.; Rez-seal Euclid Chemical Company or equal on all proposed concrete pavement.

2.11 REINFORCING STEEL:

A. As shown on the Drawings. Bars in joints connecting to city streets must be epoxy coated, all other bars may be plain, non-epoxy coated.

B. Construction joints shall be keyed and tied with 30” long, #5 deformed bars, placed on 30” centers.

2.12 CURING AND PROTECTION MATERIALS:

A. Liquid Curing Compounds: White pigmented; dry to the touch in 4 hours, non-tracking in 12 hours. Readily applied by spraying at temperatures above 40° F.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION:

A. Excavate, fill, compact, grade and prepare subgrade as specified in Earthwork Section 02300.

1. Unless otherwise ordered by the Engineer, the subgrade, at time of placing concrete for Concrete Pavement, shall be in a uniformly moist but not muddy condition to a depth of not less than one inch.

2. Subgrade Loading:

   a. Where concrete trucks must travel on a prepared soil-type subgrade to unload and, as approved by the Engineer, watering of the subgrade must be limited to just ahead of the paving machine.
   b. Repetitive loading on the subgrade by concrete trucks shall be minimized by entering and exiting the subgrade on side streets.
   c. Loads in excess of the legal axle load shall not be allowed on the completed subgrade.
   d. Partially loaded trucks may be required.
   e. If subgrade/subbase failure occurs, the repair shall be coordinated with the Engineer.

3. Paving Suspended:

   a. The paving operation shall be suspended where subgrade stability has been lost.
   b. No concrete shall be placed upon a subgrade which has become unstable, bears ruts or
tire marks of Contractor's equipment or which is excessively softened by rain until such subgrade has been reconsolidated and replanned or reshaped to correct the objectionable condition.

c. If necessary, scarify to a minimum depth of 6 inches, aerating, and recomping the Contractor's expense. Recompaction shall meet requirements of Section 31 20 00.

4. Maintenance of Subgrade:

a. The Contractor is responsible for maintenance of the completed subgrade during subsequent construction activities.

b. Before allowing hauling equipment to use the completed subgrade, the Contractor must be satisfied as to the effect this hauling equipment may have on the partially completed work.

3.02 SURFACE FIXTURE ADJUSTMENT

A. Adjust manhole frames and other fixtures within area to be paved to conform to finished surface.

B. Clean outside of fixture to depth of pavement before concrete placement.

C. Box out fixtures for later adjustment where allowed. Size and shape of box out for intakes as shown in Standard Drawings.

3.03 FORMS:

A. Set base of forms at or below subgrade elevation with top of forms at pavement surface elevation.

C. Extra height forms with Engineer approval may be used to back up integral curb and paving slab; set base at or below subgrade elevation with top of form at top of curb elevation.

D. Secure forms in place to required grade and alignment.

E. If voids occur under forms, remove forms and rework subgrade to proper elevation and density; reinstall forms.

F. If the soil supporting the form is softened by rain or standing water so that form is inadequately supported, remove forms and rework subgrade to proper elevation and density; reinstall forms.

G. Coat forms with release agent before concrete is placed.

H. Place forms true to alignment and free of latent concrete. Use wood or steel forms adequately staked and braced for all exposed slab edges.
1. Leave forms in place not less than eight (8) hours after concrete is placed. If removal causes damage to concrete, leave forms on as long as necessary to prevent damage. Remove forms with care to prevent cracking, spalling or overstressing concrete.

3.04 REINFORCING PLACEMENT

A. Reinforcing metal shall be clean, straight, free from distortion and rust, and shall be firmly secured in position as detailed.

B. All reinforcing metal shall be placed in approved storage to prevent damage; do not distribute along the work site except as needed to avoid delay in paving.

C. Place reinforcing steel as shown on the detailed drawings or as specified; support and secure bars by approved chair and wire assemblies; bars to be checked by the Engineer upon notification from the Contractor.

D. Place steel centered in the pavement reasonably in advance of the paving operations.

E. Joint Steel:

1. All joints shall be constructed of the type, dimensions, and at the locations required by the plans or special provisions.
2. Tie bars for all longitudinal joints shall be installed so as to be in the intended position in the completed pavement. Tie bars for all longitudinal joints shall be positioned on chairs and secured against movement with metal stakes during placing and finishing of concrete unless otherwise approved by the Engineer. If approved by the Engineer, bars may be placed in position by a machine or other method. For tie steel that is placed mechanically in plastic concrete, the Engineer may:
   a. Manually check locations and depth of the steel in the plastic concrete behind the slip form paver using the following frequencies:
      • once every 200 lineal feet for tangent roadway sections
      • in at least three locations within all horizontal curve sections
      • for each inspection, at least two tie steel locations within a panel
   b. Using a magnetic locator, verify locations of tie steel in hardened concrete every day. Check out-of-tolerance tie steel to identify the extent of the problem for a retrofit correction.

3. The Contractor shall provide adequate means to ensure that the load transfer devices and tie bars for key type joints are properly secured to maintain correct position and alignment during the placement of concrete.
4. Other tie bars shall be placed in such a manner as to ensure that the bars are located in reasonably close conformity with the specifications.
5. Care should be taken to prevent disturbance or damage of the joint assembly. Bars must be
supported by approved chairs or method approved by Engineer.

3.05 JOINTS:

A. The Contractor shall submit a concrete jointing plan to the Owners Representative for approval 10 days prior to the start of paving. Joint design for concrete pavement shall be based on the current Guide for Design and Construction of Concrete Parking Lots published by the American Concrete Institute (ACI 330R-92). It is desired to have joint lines match edges of travel lanes. Joint locations shall be chalked with a string line before sawing.

B. Saw cut control joints. Joints to be 1/8" minimum and 1/4" maximum width. All transverse contraction joints shall be sawed at a maximum spacing of 2 T, where T is the thickness of the pavement in feet. In sidewalks space joints to create square panels, with a maximum spacing of 2 T, unless shown on the plans.

All joints shall be sawed to a depth shown below.

<table>
<thead>
<tr>
<th>Minimum Sawcut Depth</th>
<th>Conventional Saw</th>
<th>Early &quot;Green&quot; Saw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transverse &quot;C&quot; Joint</td>
<td>T/3</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>All other Transverse Contraction joints</td>
<td>T/3</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>Longitudinal Joint</td>
<td>T/3</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

C. In order to prevent shrinkage cracks, sawing shall be commenced promptly after the pavement has obtained sufficient strength to resist tearing of the concrete adjacent to the joint during the process of sawing; complete such work within twenty-four (24) hours after concrete is placed.

D. Round outside edges of sidewalk with edging tool with approximately one half-inch (1/2") radius.

E. Round edges of sidewalk or curbs adjacent to expansion joints with edging tool with approximately one-eighth inch (1/8") radius.

F. Construction Joint - Keyed and tied joints shall be used at ends of all concrete pours. Bars to extend through joints a minimum of twenty-four (24) bar diameters.

G. Expansion joints (isolation joints) shall be installed in concrete pavement slabs and sidewalks where the concrete meets other structures such as light pole bases, intakes, buildings and all other similar structures. Hold joint material down one-half inch (1/2") and fill with sealant. Also used were sidewalk meets concrete curb.

H. Joints sawed with an early "green" concrete saw shall be washed out prior to sealing. The concrete must be capable of supporting the sawing operations to allow the use of an early green concrete saw.
I. Construction Joints:

1. Longitudinal or transverse construction joints shall be placed between adjacent lanes of concrete and at end-of-day header runs.
2. Manhole boxouts shall be located and placed on grade prior to paving. Manhole boxouts are required for two piece castings for sanitary/storm manholes.
3. The longitudinal construction joints shall be an approved key type joint with legs unless machine placed.
4. Transverse construction joints shall employ load transfer devices (Header) and shall be placed whenever concrete placement is delayed for more than 30 minutes.

3.06 CONCRETE PAVEMENT PLACEMENT

A. Set survey control stakes at 25 foot maximum spacing including high and low points. Additional staking may be required by the Engineer.

B. The concrete shall be placed, consolidated, and finished to the widths and depths outlined in the plans.

C. Integral curbs shall be poured with the slab in a single paving machine operation. Normal mainline paving will not have construction joints at integral curbs.

D. The concrete shall be deposited upon the supported reinforcement keeping segregation to a minimum.

E. Concrete shall be deposited to the full depth of the pavement in a single operation.

F. Necessary hand spading and spreading shall be done with shovels and not rakes.

G. Use paving machine for all uniform width slabs 8 ¼ feet or more in width and 250 feet or more in length.

H. When pavement is constructed in separate lanes, the junction line in straight sections shall not deviate from the true line shown on the plans by more than ½ inch at any point and shall be tooled to the radius shown on the plans. A joint formed with a metal keyway shall be used between separately poured lanes.

I. Place concrete to full depth in single operation. Keep a uniform pile of concrete in front of the paving machine, up to a maximum of 6 to 8 inches above the design surface elevation.

J. The concrete shall be distributed and spread as soon as placed. A mechanical concrete spreader may be used.

K. Concrete Screed:
1. The concrete shall then be struck off and screeded by mechanical means.
2. The striking off or screeding shall conform to the crown and cross section shown on the plans.
3. If, in the operation of subgrade or finishing equipment, it is necessary to operate one or both sets of wheels or tracks on previously placed concrete, the wheels or tracks shall be adjusted so that the bearing on the concrete will be not less than 3 inches from the edge of the pavement.
4. When operating with two wheels on the previously placed concrete and two wheels on the form, the form wheels shall be double flanged.
5. All wheels operating on the pavement shall be flangeless and rubber tired. All tracks operating on the pavement shall use rubber, wood, or belting pads.

L. The top of the forms shall be kept clean from accumulations of concrete, and the travel of the finishing machine on the forms shall be maintained true without lift, wobbling, or other variations tending to affect precision of finish.

M. When finishing by hand methods, concrete shall be consolidated by use of vibrating units operating in the concrete. Unless the vibrating apparatus is such that the full width of concrete is consolidated in a single passage, a definite system or pattern shall be used in the operation of the vibrator so the full width of concrete in each linear foot of lane will receive adequate and uniform consolidation. The system and methods of vibrating shall be subject to approval by the Engineer. Vibrating equipment shall meet the requirements of IDOT Section 2301.07. Vibrating equipment shall, under no circumstances, be used as a tool for moving concrete laterally on the grade.

3.07 CURB AND GUTTER CONSTRUCTION

A. Construct curb and gutter if shown on drawings.

B. Use paving machine slip-form for curb; curb mule or similar mechanical equipment providing equivalent results.

C. Hand methods shall be allowed for radius, returns, and sections of curb and gutter 100 feet or less in length.

D. When depressed curb at driveways and where sidewalk intersects street, use templates to form backs of such curbs.

E. Form and construct curb by hand only where barrier or depressed curb is required and where small radii or other special sections preclude use of mechanical equipment.

F. Finish curb as rapidly as finishing operations on pavement permit. Maximum distance behind paving machine is 100 feet.

G. Remove free water, latency, dust, leaves, or other foreign matter prior to placing concrete for curb.
H. Use freshly mixed concrete; do not store concrete in receptacles at side of pavement for use in curb at a later time; do not use concrete requiring retempering.

I. Vibrate or puddle concrete to secure bond with paving slab and eliminate rock pockets.

J. Secure final finish on curbs by hand method, including 6 foot straightedge or 6 foot slipform.

K. Edge, protect, and cure curb in same manner as pavement.

L. Check surfaces of curb and gutter with 10 foot straightedge; correct variations greater than 1/8 inch; remove and replace curbs having varying cross section.

3.08 FINISHING:

A. Screed, level and float all slabs to true, level and straight lines.

B. Exterior slabs and platforms to be medium hair broom finish, with no coarse aggregate visible, unless otherwise specified on drawings.

C. Tolerances on all surfaces not more than three-sixteenths inch (3/16") in ten foot zero inch (10'-0").

D. Formed surface finish:

1. Remove bulges, fins, form marks and roughness from exposed surfaces by grinding.

2. Subject to Engineer's approval, fill honeycombed and other defective areas by cutting out to solid concrete (minimum depth= 1") with straight edges and at right angles to the surface. Dampen area to be patched, brush on grout of equal parts Portland Cement and sand and follow immediately with patching mortar. Large or objectionable areas will require full removal and replacement at Engineer's discretion.

3. Patching mortar to be not richer than one (1) part Portland Cement to three (3) parts sand. Color of patching mortar shall match the adjacent concrete. (Substitute white Portland Cement for part of the grey cement as needed to provide color match.)

4. Trowel or burlap rub patched areas to match the surrounding concrete area. Clean all walls upon completion.

5. Exposed concrete wall faces and tops to have a uniform smooth rubbed finish. Moisten concrete surfaces and rub with Carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

3.09 SURFACE CURING
A. Apply liquid curing compound in a fine spray to form a continuous, uniform film on the horizontal surface and vertical edges of pavement, curbs and back of curbs immediately after surface moisture has disappeared, but no later than 30 minutes after finishing. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties to ensure acceptable macrotexture is achieved.

1. Use a white pigment liquid curing compound.

B. Apply compound with power sprayer; rate of application not less than 0.067 gallon per square yard (15 square yards per gallon); do not dilute compound.

C. If forms are used, apply to pavement edges and back of curbs within 30 minutes after forms are removed.

D. Protect concrete pavement during cold weather for at least 5 days, or protect a minimum of 24 hours and flexural strength of 500 psi. See Section 1.08 above.

3.10 JOINT SEALING

A. Timing:

1. Unless otherwise provided, before any portion of the pavement is opened to the Contractor’s forces or to general traffic, joints that require sealing shall be sealed.
2. The Engineer may limit the wheel loads and axle loads of equipment operating on the pavement during this operation, if prior to the age and strength specified in Section 1.08 above. Additional tests to determine the modulus of rupture may be required.

B. Cleaning:

1. For those joints that are not to be sealed, cleaning is not required.
2. For those joints that are to be sealed, the residue from sawing shall be removed from the crack. An air compressor that provides moisture-free and oil-free compressed air shall be used. Removal of wet-sawing residue by flushing with high pressure water may be necessary prior to blowing the crack clean.
3. Joint Sealer:

a. Joint sealer shall be prepared and installed in the joint and to the proper level as shown in the contract documents and as recommended by the manufacturer.

b. Hot-poured sealers shall be heated in a thermostatically controlled heating kettle; the material shall be heated to the temperature required for use, but not above that recommended by the manufacturer. After sealing, excess sealer shall be removed from the pavement surface.

c. Joint sealer shall be placed only when the pavement and ambient air temperatures are 40° or higher. When near this minimum, additional air blasting or drying time or both may be necessary to assure a satisfactory bond to the joint surfaces.

d. When this sealer cannot be properly placed due to late fall work, the Contractor shall
submit a joint construction plan and sealing details to the Engineer for approval before paving can begin.

e. Joints shall be sealed the same day they are cleaned. Sealing shall be done only when the joint surfaces appear dry by visual examination.

f. If surface correction required the joints may need to be re-cleaned and re-sealed.

3.11 DEFECTS OR DEFICIENCIES

A. Pavement containing excessive cracks, fractures, spalls, or other defects shall be removed and replaced or repaired at no cost to Owner. Remedy to be determined by Engineer. In lieu of the above, the Engineer may approve an extended warranty or price adjustment.

B. Pavement Thickness Deficiency:

1. The bid amount for portland cement concrete pavement shall be adjusted by a "Concrete Thickness Pay Factor" before final payment is made.

2. On the basis of the core lengths, pavements will be classified in the following bands:

<table>
<thead>
<tr>
<th>Band Limits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band 1</td>
<td>Pavement of design or greater thickness or deficient by not more than 0.15</td>
</tr>
<tr>
<td></td>
<td>inch.</td>
</tr>
<tr>
<td>Band 2</td>
<td>Pavement deficient in thickness by more than 0.15 inch, but not more than</td>
</tr>
<tr>
<td></td>
<td>0.25 inch.</td>
</tr>
<tr>
<td>Band 3</td>
<td>Pavement deficient in thickness by more than 0.25 inch, but not more than</td>
</tr>
<tr>
<td></td>
<td>0.50 inch.</td>
</tr>
<tr>
<td>Band 4</td>
<td>Pavement deficient in thickness by 0.51 inch or more.</td>
</tr>
</tbody>
</table>

3. Thickness Cores:

a. One 4 inch core shall be taken initially for each section of approximately one thousand (1,000) square yards.

b. For any core outside of Band 1, two additional cores shall be taken in that section of pavement, and the average of the three cores shall be used.

c. Core locations shall be selected at random by the Engineer.

d. It shall be assumed that each original core or additional core is representative of the pavement thickness for a distance extending one-half the distance to the next core, measured along center line, or in the case of an initial or final core, the distance will extend to the end of the pavement section.

e. At the direction of the Engineer, the Contractor shall cut samples from the finished pavement or other course by drilling with a core drill of a size that will provide samples of a 4 inch outside diameter.

f. Core holes shall be restored by tamping low slump concrete into the hole, and finishing and texturing the surface. Cores shall be identified and delivered to the testing laboratory or Engineer.

g. On the basis of core lengths, the pavement or various sections of pavement shall be classified
in the following bands. Core lengths shall be measured as outlined in Iowa DOT Materials I.M. 347.

<table>
<thead>
<tr>
<th>Pay Factor for Concrete Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

h. The Engineer shall study the extent and severity of the deficiencies of pavement areas for Band 4. Depending on the severity, the Engineer shall require one of the following procedures:

1. The deficient areas shall be removed at the Contractor's expense and replaced with pavement meeting the contract requirements.
2. A mutually acceptable agreement may be negotiated between the contractor and the Engineer which provides a combination of an extended guarantee period and payment penalty and allows the pavement for the area in question to be left in place.

END OF SECTION 02751
JOINT DETAIL DRAWINGS  (Expansion, Transverse, and Longitudinal):

SEE DETAIL "A"  PREFORMED RESILIENT JOINT MATERIAL

'E' JOINT
1" EXPANSION JOINT

5/8"  1/2" JOINT SEALANT MATERIAL

DETAIL "A"

EXPANSION JOINTS
**Transverse Contraction Joints**

**Not to Scale**

### Refer to Bar Size Table

<table>
<thead>
<tr>
<th>BAR SIZE TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td>&lt; 8&quot;</td>
</tr>
<tr>
<td>DOWEL SIZE</td>
</tr>
<tr>
<td>TIE BAR SIZE</td>
</tr>
</tbody>
</table>

1. Refer to bar size table.
2. 'Dw' joint shall be located at midpanel, between future 'C' or 'CD' joints. Minimum 5'-0" to a 'C' or 'CD' joint.
3. Bars in transverse joints shall be no closer than 8" to longitudinal joint. Distance to first bar from edge of pavement will vary 6" to 12" depending upon pavement width.
4. Joints shall be sealed according to the standard specifications on "sealing".
5. Placement of dowels or tie bars shall be in accordance with specifications.
6. 'RT' joint may be used in lieu of 'Dw' joint. Pavement damaged due to drilling shall be removed at the contractor's expense.
LONGITUDINAL CONTRACTION JOINTS

1. Bar supports may be necessary for fixed form paving, to insure bar remains in horizontal position.

2. The following joints are interchangeable, subject to the pouring sequence:
   - KT-1, KT-1', and L-1
   - KT-2 and L-2
   - KT-3 and L-3

3. Depth of sawcut shall be T/3.
SECTION 02764 - PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within cement concrete pavement.
2. Joints between cement concrete and asphalt pavement.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Samples: For each type and color of joint sealant required.
C. Product test reports.
D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

1.03 QUALITY ASSURANCE

A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

1. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Colors of Exposed Joint Sealants: gray, unless selected by Architect from manufacturer's full range.

2.03 Poured Joint Sealants

A. Pavement:

1. Products:
   a. Bemac, Div. of McAsphalt; Beram 195/195LM.
   b. CRAFCO; ROAD SAVER 231.
   c. Koch Pavement Solutions; Koch Product #9030
   d. Maxwell Products, Inc.; Elastoflex 71.
   e. P.T.Products; DURA FILL 3405 LM.
   f. W.R.Meadows; 3405 Modified (Hot Pour)
   g. WRM SOF SEAL (2Comp. Cold Pour)
   h. Or Equal

B. Walks:

1. Products:
   a. Sonneborn Products; Sonolastic SI.-1. Color gray.
   b. Or Equal

2.04 Joint-Sealant Backer Materials

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
PART 3 - EXECUTION

3.01 INSTALLATION

A. Timing: Unless otherwise provided, before any portion of the pavement is opened to the Contractor's forces or to general traffic, expansion joints and sawn joints shall be sealed.

B. Cleaning:

1. Before scaling joints narrower than 3/8 inch, the residue from sawing shall be cleaned from the crack. Dry sawing residue shall be blown from the joint. Wet sawing residue shall be flushed away by high pressure water blast cleaning.

2. For joints 3/8 inch wide or wider, sand cleaning shall be used. When the joint surfaces appear dry by visual examination, the upper 3/4 inch of each joint face shall be cleaned by sand blast methods, followed by joint cleaning with air blasting. Air compressor shall provide moisture and oil-free compressed air. The angle of approach of the sand blast nozzle to each vertical face of the reservoir shall be approximately 30 degrees and the sand blast nozzle must have a guide which inserts in the joint and assures positive location and directional control of the nozzle.

3. Joint Sealer:

a. Joint sealer shall be prepared and installed in the joint and at the proper level as shown in the contract documents and as recommended by the manufacturer.

b. Hot-poured sealers shall be heated in a thermostatically controlled heating kettle; the material shall be heated to the temperature required for use, but not above that recommended by the manufacturer. After sealing, excess sealer shall be removed from the pavement surface.

c. Joint sealer shall be placed only when the pavement and ambient air temperatures are 40 degrees Fahrenheit or higher. When near this minimum, additional air blasting or drying time or both may be necessary to assure a satisfactory bond to the joint surfaces.

d. When this sealer cannot be properly placed due to late fall work, the Contractor shall submit a joint construction plan and sealing details to the Jurisdictional Engineer for approval before paving can begin.

e. Joints shall be sealed the same day they are cleaned. Sealing shall be done only when the joint surfaces appear dry by visual examination.

f. Where a curb does not exist, the joint opening at the pavement edges shall be sealed with tape.

g. If surface correction required the joints may need to be recleaned and resealed.

C. Install backer materials to support sealants during application and at position required to produce optimum sealant movement capability. Do not leave gaps between ends of backer
materials. Do not stretch, twist, puncture, or tear backer materials. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants at the same time backings are installed to completely fill recesses provided for each joint configuration and to produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 02764
SECTION 02766 - PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pavement Markings.

1.02 DESCRIPTION OF WORK

A. For marking of completed pavement surfaces.

1.03 SUBMITTALS

A. Minimum of two weeks prior to commencing any pavement marking operations, the Contractor shall submit a manufacturer's catalogue sheet for each type of pavement marking paint used for review and approval by the Engineer.

SCHEDULING AND CONFLICTS

A. Construction Sequence:
   1. Submit plan for construction sequence and schedule prior to commencing construction.

B. Conflict Avoidance:
   1. Notify Engineer of conflicts discovered or changes needed to accommodate unknown or changed conditions.

C. Conform to Local, State and Federal Requirements.

1.05 RESTRICTIONS ON OPERATIONS

A. Surface Temperature Restrictions: Pavement markings shall not be placed when the temperature of the pavement surface is less than 40 degrees Fahrenheit, or between October 15th and April 1st.

PART 2 - PRODUCTS
2.01 Waterborne Paint

A. The paint shall be capable of being heated and sprayed applied up to a temperature of 140° F without damaging the formulation or serviceability of the paint. The paint shall be free from heavy metals as defined by the U.S. EPA.

B. Pigment Content: The percent pigment by weight of the finished product shall be from 45% to 55% by weight for white and 55% to 58% for yellow paint as tested by ASTM D 3723.

C. Resin Solids shall be composed of 100% acrylic emulsion polymer.

D. Nonvolatile Vehicle: The nonvolatile vehicle shall not be less than 43% by weight for white paint and not less than 45% by weight for yellow paint.

E. Volatile Organic Compounds: Volatile organic compounds shall not exceed 1.25 pounds per gallon excluding water and VOC exempt solids. ASTM D 3960 shall be used to determine the levels of VOCs.

F. Density: The density shall be a minimum of 12 pounds per gallon and the density of the production batches shall not vary more than +/- 0.2 pounds.

G. No-Pick-Up Time: The no-pick-up time for the paint shall be less than 5 minutes.

PART 3 - EXECUTION

3.01 CLEANING AND PREPARATION OF PAVEMENT

A. The pavement surface shall be dry and free from dirt, dust, oil and other contaminants which may interfere with the paint from properly bonding to the surface. The clean surface shall be at least 1 inch wider than the anticipated marking. An air blast shall occur immediately prior to the new marking being placed. The air blast is not intended to remove large amounts of dust or dirt, but only a small amount of residue that might be left after the cleaning operation.

3.02 UNIFORM APPLICATION

A. All painted markings shall have uniform thickness and width. The width of the lines shall be as specified with a tolerance of +/- ¼ inch for 4-inch lines and +/- ½ inch for wider lines.

B. The wet film thickness of the paint shall be 14 mils, used at a rate of 305.5 ft. of solid 4" line per gallon of paint.
3.03 TRAFFIC CONTROL

A. Traffic control shall remain in place from the time cleaning operations have started through the completed curing time of the newly applied paint markings.

3.04 MARKING REQUIREMENTS

A. Parking Stalls:
Solid yellow lines, 4 inches wide by 18 feet in length shall be placed for each parking stall as shown in the plans. The spacing shall be nominally 9 feet on center, with slight adjustments allowed for stalls to be evenly spaced between curbing.

B. Symbols and Stop Bars:
Symbols, directional arrows, and stop bars shall be painted yellow. Size and shape shall follow the Manual of Uniform Traffic Control Devices. Locations as shown in the plans.

C. Handicap Access Symbols and Aisles:
Symbols, painted with yellow color, a minimum of 5 feet in height, shall be placed as shown in the plans. Access aisles shall be painted yellow with a diagonal stripe pattern, lines placed 2 feet apart on center.

D. Loading Zones:
Solid yellow lines 4” wide shall be placed as shown in the plans for loading zones. The lines shall be placed diagonally, spaced 2 feet on center. A solid yellow line shall outline the area on the pavement and on the curb.

END OF SECTION 02766
SECTION 02920 - SODDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including Bidding Requirements, General and Supplementary Conditions and Division I Specification Sections, apply to work specified in this Section.

1.02 WORK INCLUDED:

A. Provide all labor, materials, equipment and supervision required to furnish and install sodding including:

B. Fertilizer.

C. Sod.

D. Watering.

E. Initial maintenance of sodded lawns.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

A. Division 2 Section “Earthwork.”

B. Divisions 2 Section :Landscape Grading.”

C. Division 2 Section “Trees, Shrubs & Groundcover.”

1.04 QUALITY ASSURANCE:

A. All materials described and specified herein shall be subject to acceptance and approval by the Architect and/ or Owner..

B. This acceptance does not waive the right to reject any material after it has been delivered to the site and/or installed.

1.05 SUBMITTALS:

A. Product Data: For each type of product indicated.

B. Sod Growers Certification.
C. Certification of turf species comprising sod.

D. Bills of Lading and/or certification of formulation for fertilizer.

1.06 CODES, PERMITS AND FEES:

A. Obtain any necessary permits for this Section of Work and pay any fees required for permits.

B. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

1.07 JOB CONDITIONS:

A. Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.

2. Underground utilities shown on the drawings have been taken from existing public records, Owner's records available as-built drawings and are correct to the best of our knowledge, provided for information only.

3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities caused by Contractors negligence to the satisfaction of Utility Owner at no cost to the Project Owner.

4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by owner and then only after acceptable temporary utility services have been provided.

5. Provide minimum of 48-hour notice to Owner and/ or Architect and receive written notice to proceed before interrupting any utility.

B. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by this work.

4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

1.08 SITE DISTURBANCES:
A. Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, drives, utilities, plants, etc.

B. Verify locations and depths of all underground utilities prior to excavation.

C. Repair and/or return to original condition any damage at no cost to Owner.

1.09 DELIVERY, HANDLING AND STORAGE:

A. Protect sod from dehydration, contamination and heating during transportation, delivery and storage.

B. Sod shall be harvested, delivered and transplanted within a period of thirty-six (36) hours unless a suitable preservation method is approved.

C. Keep stored sod moist and under shade or covered with moistened burlap.

D. Sod showing visible signs of heating will be rejected.

E. Do not tear, stretch or drop sod.

F. Deliver fertilizer to site in original, unopened containers, each bearing manufacturer's guaranteed analysis.

G. Store packaged materials off ground and protect from moisture.

1.10 GUARANTEE:

A. Guarantee all sodded areas until final sod acceptance.

B. Acceptance criteria is as defined in this Section.

C. Sodded lawn areas which do not meet the requirements of acceptance at time of acceptance shall be resodded and maintained as originally specified at no additional cost to Owner.

PART 2 - PRODUCTS

2.01 SOD:

A. Well established, nursery grown sod consisting of three (3) to four (4) improved Kentucky Bluegrass cultivars selected from the following list:

1. Adelphi Kentucky Bluegrass.
2. Aquilla Kentucky Bluegrass.
3. Baron Kentucky Bluegrass.
4. Bonnie Blue Kentucky Bluegrass.
5. Cheri Kentucky Bluegrass.
7. Benson Kentucky Bluegrass.
8. Majestic Kentucky Bluegrass.
9. Parade Kentucky Bluegrass
10. Ram I Kentucky Bluegrass.
11. Touchdown Kentucky Bluegrass.
12. Victa Kentucky Bluegrass.

B. Free from weeds, crabgrass, stone and other foreign materials.

C. Mown at a height of two inches (2") prior to cutting.

D. Machine cut at a minimum uniform soil thickness of one-half inch (1/2") thickness measurement to exclude top growth and thatch.

E. Free of objectionable grassy and broadleaf weeds; allowable tolerance: Less than five (5) weed plants per one hundred (100) square feet of area.

F. Approved by Architect and/or owner prior to placement.

G. Peat sod will not be accepted.

H. No mesh allowed in sod.

2.02 FERTILIZER:

A. Commercial grade.

B. Formulation: 8-32-16.

2.03 WATER:

A. Sod Contractor shall apply water as necessary during establishment period.

B. Water application to be managed by sod contractor until sod is accepted by Owner.

C. Water hoses, sprinklers, water trucks or other necessary water conveyance equipment shall be provided by contractor.

PART 3 - EXECUTION

3.01 COMMENCEMENT DATE:

A. Commence sodding of lawn areas at the earliest possible date that site conditions permit.

B. Contractor to coordinate sod installation with Contractor.
3.02 SODDING SEASONS:

A. Sodding may be done during the following periods: April 15 - June 15 and August 1 - November 1.

B. Sodding may be done at other times when weather permits, with consent of the Owner.

C. Sodding is prohibited when the ground is frozen.

3.03 SITE PREPARATION:

A. No sodding shall be done until final acceptance of finished fine grading by Owner.

B. Scarify topsoil to a minimum depth of 3" and lightly rake to provide a smooth, uniform and fine surface texture. Remove ridges and fill depressions as required to drain.

C. Remove gravel or stone left over from other construction operations and sticks, roots and rubbish.

D. Top of finish grade shall be below adjacent curbs, walks, and drains approximately 1-1/2" so that after sod is installed it will be flush or slightly below curbs, walks, drains and seeded areas. Any sod not conforming to this requirement will be removed, the sub-grade adjusted, and the sod re-laid in compliance.

3.04 FERTILIZING:

A. Apply fertilizer to the soil surface before laying sod.

B. Application rate: Two (2) pounds of actual P205 per one thousand (1000) square feet, thoroughly mixed into upper two inches of topsoil.

C. Owner to be notified forty-eight (48) hours in advance by Contractor when this operation is to take place.

3.05 LAYING:

A. Lay sod uniformly, evenly and parallel to the finished contour.

B. Begin sodding at bottom of slopes.

C. Lay each roll snugly against the next leaving no void areas.

D. Butt side and end joints.

E. Stagger end joints in adjacent rows.
F. Do not stretch or overlap sod.

3.06 SOD PATCHING/FITTING:
   A. Trim existing sod at edge to allow neat fit for new sod.
   B. Neatly trim new sod to allow tight fit at edges.
   C. Remove or add soil to patch area as necessary to permit patched area to match surrounding grades. Scarify patch area to 3" depth and smooth, ready for sod.

3.07 STAKING:
   A. On grades 3:1 or greater, stake each roll with at least three (3) flat wood stakes to prevent movement under normal rainfall conditions. Use additional stakes on steeper grades.

3.08 INITIAL WATERING:
   A. Not more than one (1) hour shall elapse between the laying and the initial watering of the sod.
   B. Initial watering shall be such that the underside of all sod and the sod bed shall be thoroughly wet.

3.09 ROLLING:
   A. After all sod is laid and thoroughly watered, roll all sodded areas (except pegged sod), either with a small mechanical or hand roller, sufficiently to set or press sod into soil.

3.10 MAINTENANCE:
   A. Maintenance period: Maintain all sodded lawn areas until sod has rooted into topsoil. Maintenance to include watering and mowing as necessary.
   B. Sod acceptance shall be based upon following criteria:
      1. Terms of the maintenance period, as defined in this paragraph, have been executed. Sod shall be rooted into topsoil.
      2. Sod is weed free, healthy and in a flourishing condition.
      3. Scattered bare spots do not exceed one (1) square foot in area.
      4. Scattered bare spots do not exceed three percent (3%) of the total lawn area.
      5. Grass shall not exceed 3" in height at final acceptance.

3.11 FINAL ACCEPTANCE:
A. Upon completion of the work and fulfillment of the requirements of this Section, notify the Landscape Architect in writing that the work is ready for final acceptance.

B. Request a definite date for final acceptance.

D. Notify the owner five (5) days prior to the requested final acceptance date.

C. Resod and maintain all sodded lawn areas which do not meet the requirements of this Section at the time of final acceptance.

E. Replacement work (resodding, maintenance, etc.) shall be as specified in this Section for original sodding.

D. Replacement work shall be reinspected before acceptance.

G. Furnish detailed written recommended maintenance program to the Owner with a copy to the Architect, prior to final acceptance of the sodding.

3.12 CLEAN UP;

A. Remove from the site all debris resulting from the sodding operation.

END OF SECTION 02920
SECTION 02923 - LANDSCAPE GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES:
   A. Final grade topsoil for finish landscaping shown on Landscape Drawings.

1.2 RELATED SECTIONS:
   A. Division 2 Section “Earthwork.”

PART 2 - PRODUCTS

2.1 MATERIALS:
   A. Topsoil: Fertile, friable loam, capable of sustaining vigorous plant growth, from well
      drained site free from flooding, not in frozen or muddy conditions; reasonably free from
      subsoil, clay lumps, roots, grass, weeds, stones larger than one inch (25 mm) diameter,
      and foreign matter; acidity range (pH) of 5.5 to 7.5; containing minimum 4 percent and
      maximum 20 percent organic matter.

PART 3 - EXECUTION

3.1 EXAMINATION:
   A. Verify building and trench backfilling has been inspected.
   B. Verify subsoil base has been contoured and compacted.

3.2 SUBSOIL PREPARATION:
   A. Eliminate uneven areas and low spots.
   B. Remove debris, roots, branches, and stones in excess of 1/2 inch (13 mm) in size.
      Remove subsoil contaminated with petroleum products.
   C. Scour subgrade to depth of 3 inches (75 mm), where topsoil is to be placed. Scour
      areas where equipment used for hauling and spreading topsoil has compacted subsoil.
3.3 PLACING TOPSOIL:

A. Place topsoil in areas to be seeded or sodded and planted, to thickness as scheduled (Paragraph 3.6).

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough and low areas. Maintain levels, profiles, and contours of subgrade.

D. Remove roots, weeds, and foreign material while spreading.

E. Manually spread topsoil close to building to prevent damage.

F. Lightly compact placed topsoil.

G. Leave site clean and raked, ready to receive seeding or sodding and landscape planting.

3.4 TOLERANCES:

A. Top of Topsoil: Plus or minus 1/4 inch (6 mm).

3.5 PROTECTION:

A. Protect landscaping and other features remaining as final work.

B. Protect existing structures, walls, sidewalks, and paving.

3.6 SCHEDULE OF TOPSOIL DEPTHS:

A. The following paragraphs identify compacted topsoil thickness for various locations.

1. Perennial Planting Beds: Minimum 6 inches
2. Native Plants and Grass Areas: Minimum 6 inches.
4. Turf seeded and sodded Areas: Minimum 6 inches
5. Ground Cover: Minimum 12 inches.

END OF SECTION 02923