CORAL RIDGE MALL ANCHOR BOX REDEVELOPMENT

SPECIFICATIONS

June 15, 2016

01 5723 Storm Water Pollution Prevention Plan
01 5723.10 Storm Water Pollution Prevention Plan Contractor/Subcontractor Certification
01 5723.20 Storm Water Pollution Prevention Plan Inspection Report
01 5723.30 Storm Water Pollution Prevention Plan Table of Contractors/Subcontractors Implementing Erosion/Sediment Control Measures
01 5723.40 Storm Water Pollution Prevention Plan Owner Certification
31 2500 Erosion and Sediment Control
32 1316 Integrally Colored Concrete
32 8400 Irrigation System – Performance Specification
32 9100 Landscape Planting
32 9200 Seeding
PART 1 GENERAL

1.1 DESCRIPTION

A. This Storm Water Pollution Prevention Plan (SWPPP) has been prepared to satisfy the requirements of the Iowa Department of Natural Resources (Iowa DNR), General Permit No. 2, for "Storm Water Discharges Associated with Industrial Activity for Construction Activities." Refer to the Iowa Department of Natural Resources website for General Permit No. 2: http://www.iowadnr.gov/InsideDNR/RegulatoryWater/NPDESStormWater.aspx.

B. Contractor shall be responsible for implementation of the SWPPP within the contract limits identified on the Storm Water Pollution Prevention Plan.

C. In addition to the requirements of this Section, Contractor shall comply with all requirements of the General Permit No. 2 and with applicable Iowa DNR and US EPA regulations.

1.2 SITE DESCRIPTION

A. See Cover Sheet of Drawings for general location map.

B. The site consists of approximately 10.13 acres, and is located in the SW Quarter of Section 36, Township 80 North, Range 7, West of the 5th Principal Meridian, Johnson County, Coralville, Iowa. The site consists primarily of infrastructure development.

C. The activity at this site will consist of building construction. It is anticipated that approximately 6.18 of the 10.13 acres of the site will be disturbed during the construction activities.

D. The Storm Water Pollution Prevention Plan shows the following:

1. Drainage patterns.
2. Approximate slopes after major grading.
3. Areas of soil disturbance.
4. Locations of structural controls.
5. Locations of non-structural controls.
6. Locations of areas to be stabilized.
7. Surface drainage ways.
8. Storm water discharge locations.

E. Storm water runoff from the site will discharge to the storm sewer and will ultimately discharge to Clear Creek.

F. No runoff water quality data is available for this site.

1.3 CONTROLS

A. Major soil disturbing activities at the site will consist of building and utility demolition. For these activities, the erosion/sediment control measures, both structural and non-structural, and implementation of these controls is described herein or is shown on the Storm Water Pollution Prevention Plan.
SECTION 01 5723

STORM WATER POLLUTION PREVENTION PLAN

1.4 POST-DEVELOPMENT STORM WATER MANAGEMENT PLAN

A. The post-development storm water management plan consists of maintaining the system of storm sewers, intakes, and vegetative cover. It is anticipated that this plan will achieve the goal of 80 percent removal of total suspended solids.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL EROSION/SEDIMENT CONTROL MEASURES

A. During construction activities, the following practices will be observed:

1. A sign or other notice must be posted near the main entrance of the construction site or at a safe, publicly accessible location in close proximity to the construction site. The sign must be visible from a public road that is nearest to the active part of the construction site and use a font large enough to be readily viewed from a public right-of-way. The sign or notice must contain the following information:

   a. Project Name and IDNR Authorization number.
   b. Designated Person’s contact name and phone number.
   c. The current location of the SWPPP.

2. For linear projects, the sign or notice must be posted at a publicly accessible location near the active part of the construction site.

3. Ensure proper disposal of construction site waste materials. No waste materials will be disposed of on-site. The Contractor shall comply with all applicable local, state, and federal requirements regarding the disposal of excess and waste materials. Contractor shall provide to the Owner the locations where waste materials will be disposed of.

4. Prevent off-site tracking of sediment and generation of dust. Stabilized construction entrances or vehicle washing racks should be installed at locations where vehicles leave the site. Tracked sediment will be removed from the surrounding roads, drives, and parking lots by the Contractor. Identify all locations of stabilized construction entrances on the Drawings. Implement dust control measures where dust is generated. Frequent watering of the site, sprinkling/irrigation, vegetative cover, mulch, wind breaks, tillage, stone, and spray-on chemical soil treatments (palliatives) are possible dust control measures. If the dust control is not acceptable it shall be changed as directed by the Owner's Representative.

5. Treat or dispose of sanitary waste generated on-site in accordance with state and local waste disposal, sanitary sewer, or septic regulations. Identify all locations of portable restroom facilities on the Drawings. Portable restroom facilities must not be located near drainage ways.

6. Prevent contamination of allowable non-storm water discharges. Identify on the Drawings all locations of allowable non-storm water discharges. Allowable non-storm water discharges include, but are not limited to, water flushed from water lines, pavement and equipment washing (where no spills or leaks have occurred, unless the spilled material has been cleaned up) where no detergents or other surfactants are used, and uncontaminated groundwater (dewatering).

7. Identify all locations of stockpiled material on the Drawings. Contractor shall provide all erosion/sediment controls as necessary to contain material on site.
STORM WATER POLLUTION PREVENTION PLAN

8. Identify all locations of concrete, paint, and grout washout areas on the Drawings. These areas shall be protected at all times. Contractor shall haul off all waste material on site. Contractor is required to install a sign that designates the washout area.

9. Identify locations of contractor laydown/equipment storage. Contractor shall provide all erosion/sediment controls as necessary to contain materials on site.

3.2 DESCRIPTION OF CONTROLS

A. Minimum erosion/sediment control devices are shown on the plans. It is the Contractor's responsibility to control erosion and sediment on the site. Additional controls shall be installed as needed to satisfy this requirement.

B. Erosion Controls. All controls shall be in accordance with Section 31 25 00 - Erosion and Sediment Control.

C. Sediment Controls. All controls shall be in accordance with Section 31 25 00 - Erosion and Sediment Control.

3.3 SEQUENCE OF MAJOR ACTIVITIES

A. Contractor shall incorporate all temporary stabilizing and permanent erosion/sediment control features into the project at the earliest practicable time and according to the following guidelines:

1. Install intake protection and down slope and side slope perimeter controls before the land disturbing activity occurs.

2. Do not disturb an area until it is necessary for construction to proceed.

3. Cover or stabilize disturbed areas as soon as possible.

4. Time construction activities to limit impact from seasonal climate changes or weather events.

5. Delay construction of infiltration measures until the end of the construction project when upstream drainage areas have been stabilized.

6. Do not remove temporary perimeter controls until after all upstream areas are finally stabilized.

3.4 MAINTENANCE

A. Maintenance and repairs of erosion and sediment controls shall be in accordance with Section 31 25 00 - Erosion and Sediment Control.

B. The Contractor will be required to maintain all erosion and sediment controls in proper working order, including cleaning, repairing, or replacing the controls until final stabilization.

C. Refer to Section 31 25 00 - Erosion and Sediment Control for sediment cleaning from controls requirement. If not specified, cleaning of sediment controls will begin when the controls have lost 50% of their capacity.

D. The inspection reports can be used to record scheduled maintenance.

E. The Contractor will maintain records of the construction activity on the site. These records will be used to make sure that areas, where there is no construction activity, will be stabilized within the required time frame. The SWPPP will be updated to include, at minimum, the following information:

1. The dates when major grading activities occur in a particular area.

2. The dates when construction activities cease in an area, temporarily or permanently.

3. The dates when an area is stabilized, temporarily or permanently.
4. The dates when erosion/sediment controls are installed and removed.

F. For the SWPPP to be effective, the plan must accurately reflect the construction site features and operations. When the Contractor observes deficiencies in the plan or that the plan is not effective in minimizing pollutant discharge from the site, the plan must be updated and changed. Any changes that may be required to correct deficiencies in the SWPPP, noted during an inspection, should be made as soon as practical after an inspection, but in no case later than four (5) days after the inspection. In addition, the SWPPP will be updated to:

1. Include contractors identified after the submittal of the Notice of Intent. These contractors will certify the plan and be identified as co-permittees.

2. Identify any change in ownership or transference of the permit and permit responsibilities.

3.5 SPILL PREVENTION AND CLEANUP MEASURES

A. The Contractor must include in the SWPPP the Material Safety Data Sheets (MSDS) for all waste materials expected to be stored on site, with updates as appropriate.

B. The Contractor is required to furnish and install a spill kit. The spill kit shall be a sealed storage shed located near the construction trailer or fueling area. The spill kit shall be relocated as necessary for construction. At a minimum, the spill kit shall contain, but not be limited to the following items:

1. Garbage can
2. Gloves
3. Safety goggles
4. Broom and dust pan
5. Oil absorbent clay chips or pads

C. The spill kit shall be restocked as supplies are used.

D. The Contractor is required to install a sign that designates the spill kit. The location of the spill kit shall be identified on the Drawings.

E. The Contractor will be required to report any spills of substances that may create a hazardous condition to the Owner's Representative. Iowa law requires that as soon as possible, but not more than six (6) hours after the onset of a hazardous condition the IDNR and local sheriff's office or the office of the sheriff of the affected county be notified by the Owner.

F. The Contractor must modify the SWPPP within 5 calendar days of a hazardous condition. The SWPPP shall describe the release and the circumstances leading to the release as well as the date that the release occurred. Steps to prevent the reoccurrence of such releases are to be identified in the plan and implemented.

3.6 INSPECTIONS

A. The Contractor shall designate one qualified person to be the Storm Water Coordinator. This person will be required to provide inspections for the Contractor as well as maintain the SWPPP and all required documentation.

B. Inspections shall be provided by the Contractor who shall inspect disturbed areas of the construction site that have not been fully stabilized at least once every seven (7) calendar days. The SWPPP Inspection Report form in Section 01 57 23.20 - Storm Water Pollution Prevention Plan - Inspection Report shall be completed for all inspections.
C. Disturbed areas and areas used for the storage of materials that are exposed to precipitation shall be observed for evidence of, or the potential for, pollutants entering the drainage system.

D. Sediment control measures shall be observed to ensure that they are operating correctly.

E. Accessible discharge locations shall be observed to determine effectiveness in preventing significant impacts to receiving waters.

F. Locations where vehicles enter or exit the site shall be observed for evidence of off-site sediment tracking.

G. The Contractor will prepare an inspection report of the pollution control measures. The report will: report the scope of the inspection; provide the name(s) and qualifications of personnel making the inspection; include the date(s) of the inspection; identify any damages or deficiencies in the control measures; identify what actions will be taken to modify pollution control practices; and certified by signature. The SWPPP Inspection Report form will be completed for all inspections.

H. Based on the results of these inspections, the Contractor shall make revisions as required to protect receiving waters within four (5) calendar days of the date of such inspection.

I. Results of these inspections shall be recorded on copies of the inspection form provided or other standard format and kept in the Contractor's field office until the project is completed.

J. Contractor is required to provide inspections until the site has reached final stabilization and the Notice of Discontinuation (NOD) has been filed by the Owner's Representative.

3.7 IMPLEMENTATION

A. The Owner is responsible for submitting the Public Notice of Storm Water Discharge, the Notice of Intent and the Notice of Discontinuation.

B. The Owner is responsible for paying the fees for publishing the Public Notices and for submitting the Notice of Intent.

C. The Owner is responsible for resubmitting for an extension if necessary. All resubmittal fees will be paid by the Owner.

D. The Contractor is responsible for keeping the NPDES permit up to date.

E. The Contractor is responsible for the implementation and maintenance of all measures identified in this SWPPP.

F. The Contractor and all subcontractors coming on site to perform soil disturbing activities or implementing erosion/sediment control measures are required to certify the SWPPP by signing the certification statement in Section 01 57 23.10 - Storm Water Pollution Prevention Plan - Contractor/Subcontractor Certification one (1) week prior to start of construction. The SWPPP Certification Statement form at the end of this Section shall be completed by all subcontractors, throughout the duration of the project, before conducting any work at the site. The signed copies shall be kept with this SWPPP in the Contractor's field office until the project is completed.

G. The Contractor/Subcontractors implementing erosion/sediment controls on site are required to sign the Table of Contractor/Subcontractors Implementing Erosion Control Measures located in Section 01 57 23.30 - Storm Water Pollution Prevention Plan - Table of Contractor/Subcontractor Implementing Erosion/Sediment Control Measures.
SECTION 01 5723

STORM WATER POLLUTION PREVENTION PLAN

H. For ongoing construction projects, Contractor/Subcontractor may meet with the Owner’s Representative to sign the Co-Permittee Transfer Document after completion of work. Upon signature, the Contractor/Subcontractor responsibilities for storm water management and compliance with Iowa DNR NPDES General Permit No. 2 at the site will be complete, indicating that the subsequent Contractor/Subcontractor assumes responsibilities for storm water management and compliance with Iowa General Permit No. 2.

I. Upon review of the SWPPP, the Owner shall sign the Owner Certification, Section 01 57 23.40 - Storm Water Pollution Prevention Plan - Owner Certification.

J. The Contractor will be responsible for obtaining a City of Coralville Construction Site Runoff (CSR) permit. The Contractor will be responsible for preparing, obtaining and paying the permit fee for the CSR permit.

3.8 RETENTION OF RECORDS

A. A copy of this SWPPP, including all reports and certifications required by the SWPPP shall be maintained at the construction site by the Contractor from the date of project initiation to the date of final stabilization.

B. A copy of this SWPPP, including all reports and certifications required by the SWPPP and records of all data used to complete the Notice of Intent to be covered by the permit, will be kept for a period of at least three (3) years from the date that the site is finally stabilized.

C. A copy of the Notice of Intent must be included in the SWPPP.

D. All SWPPP plans and associated records must be made available to the Department of Natural Resources and the operator of the municipal separate storm sewer system (MS4) upon request.

E. Provide a copy of any modifications to the Storm Water Pollution Prevention Plan, all SWPPP Certification Statement forms, all SWPPP Inspection Reports and the Table of Contractor/Subcontractors Implementing Erosion Control Measures to the Owner's Representative as they are prepared.

3.9 FINAL STABILIZATION

A. Final stabilization is reached when all soil disturbing activities at the site have been completed. This includes the establishment of a uniform perennial vegetative cover for unpaved areas not covered by permanent structures or equivalent permanent stabilization measures (i.e. rip-rap, gabions or geotextiles). Final stabilization must be approved by the Owner's Representative.

B. Upon approval by the Owner's Representative, the Contractor is required to remove all temporary erosion/sediment controls.

C. Within thirty (30) days after all temporary erosion/sediment controls have been removed, the Contractor shall notify the Owner to submit the Notice of Discontinuation (NOD) form to the IDNR.

END OF SECTION
PROJECT NAME: Coral Ridge Mall Anchor Redevelopment – Civil/Landscape Package

Certification Statement

I certify under penalty of law that I understand the terms and conditions of the General National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site as part of this certification. Further, by my signature, I understand that I am becoming a co-permittee, along with the Owner(s) and other contractors and subcontractors signing such certifications, to the Iowa Department of Natural Resources NPDES General Permit No. 2 for "Storm Water Discharge Associated with Industrial Activity for Construction Activities" at the identified site. As a co-permittee, I understand that I, and my company, are legally required under the Clean Water Act and the Code of Iowa, to ensure compliance with the terms and conditions of the Storm Water Pollution Prevention Plan developed under this NPDES permit and the terms of the NPDES permit.

DESCRIPTION OF CONSTRUCTION ACTIVITY PERFORMED BY THE FOLLOWING CONTRACTOR/SUBCONTRACTOR

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANY NAME</td>
<td>TELEPHONE NO.</td>
</tr>
<tr>
<td>COMPANY ADDRESS</td>
<td></td>
</tr>
</tbody>
</table>

SIGNATURE__________________________ DATE__________________________

KEEP A COPY OF THIS SIGNED CERTIFICATION WITH THE STORM WATER POLLUTION PREVENTION PLAN ON THE JOB SITE. SUBMIT A COPY TO THE OWNER'S REPRESENTATIVE.
## Storm Water Pollution Prevention Plan

**Project Name:** Coral Ridge Anchor Redevelopment - Civil/Landscape Package

**Date:**

**Time:**

**IDNR Authorization Number:**

**Designated Person’s Name & Phone #:**

**Inspector Name and Title:**

**Reason for Inspection:**

**SWPPP Sign On Site:** YES / NO

**SWPPP Plan Location:**

**Spill Kit Installed:** YES / NO

**Concrete, Paint and Grout Washout Installed with Sign:** YES / NO

**Implementation of Dust Control Measures:** YES / NO

**Topsoil Stockpiles On Site:** YES / NO

### Observed Erosion/Sediment Control Measure

<table>
<thead>
<tr>
<th>Erosion Control Measure</th>
<th>Clean-up Required?</th>
<th>Change in Control Type Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary Seeding</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Mulching/Compost</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Permanent Seeding/Sodding</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Erosion Control Blanket</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Hydraulic Erosion Control</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
</tbody>
</table>

### Observed Sediment Control Measure

<table>
<thead>
<tr>
<th>Sediment Control Measure</th>
<th>Clean-up Required?</th>
<th>Change in Control Type Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compost Filter Tube</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Stabilized Construction Entrance</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Ditch Checks</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Rip-rap/Transition Mat</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Silt Fence</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Intake Protection Bag/Filter Sack/ Magnet Inlet Protection</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Curb Inlet Filter</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Dewatering Filtration</td>
<td>Yes / No</td>
<td>Yes / No</td>
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<tr>
<td>Sediment Basin/Sediment Trap</td>
<td>Yes / No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Clean-up of Roadways/Parking Lots/ Driveways</td>
<td>Yes / No</td>
<td>Yes / No</td>
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### Observations of Discharge Locations

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Observations of Erosion/Sediment Control Measures


Is uncontained sediment leaving the site? If yes, describe where and what changes will be made to erosion/sediment control devices.


Recommended Revisions to the SWPPP


Inspection Report Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Inspector's Signature      Date

KEEP A COPY OF THIS CERTIFIED REPORT WITH THE STORM WATER POLLUTION PREVENTION PLAN ON THE JOB SITE. SUBMIT A COPY TO THE OWNER'S REPRESENTATIVE.
**PROJECT NAME:** Coral Ridge Anchor Redevelopment - Civil/Landscape Package

On the following chart indicate the name of each Contractor or Subcontractor who will implement erosion/sediment control measures and which measure they will implement.

<table>
<thead>
<tr>
<th>Name of Contractor/Subcontractor</th>
<th>Erosion/Sediment Control Measure</th>
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<tbody>
<tr>
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KEEP A COPY OF THIS TABLE WITH THE STORM WATER POLLUTION PREVENTION PLAN ON THE JOB SITE. SUBMIT A COPY TO THE OWNER'S REPRESENTATIVE.
PROJECT NAME: Coral Ridge Mall Anchor Box Redevelopment - Civil/Landscape Package

Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

1425 Coral Ridge Ave., Coral Ridge Mall, Coralville, IA 52241

ADDRESS/DESCRIPTION OF THE SITE

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
</tr>
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<tbody>
<tr>
<td>Coral Ridge Mall LLC</td>
<td></td>
</tr>
<tr>
<td>COMPANY NAME</td>
<td>TELEPHONE NO.</td>
</tr>
<tr>
<td>1451 Coral Ridge Ave.</td>
<td></td>
</tr>
<tr>
<td>Coralville, IA 52241</td>
<td></td>
</tr>
</tbody>
</table>

COMPANY ADDRESS

SIGNATURE

DATE
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Included:

1. This section encompasses the work necessary to install temporary stormwater pollution control measures which shall be required of the Contractor. This work shall consist of furnishing, installing, maintaining, and removing temporary control measures as needed to prevent the discharge of silty or polluted stormwater from the construction site, or as ordered by the Owner's Representative. The control of stormwater pollution through the use of erosion/sediment control devices shall be in accordance with these specifications.

B. Stormwater Detention Basins

1. Conflict with federal, state or local laws, rules or regulations.

   a. In the event of conflict between these requirements and pollution control laws, rules, or regulations of federal, state or local agencies, the more restrictive laws, rules or regulations shall apply.

C. Method of Measurement and Basis of Payment

1. No measurement of any facility will be made. All labor and material to construct, maintain, and remove erosion/sediment control facilities shall be included in the lump sum bid price for erosion/sediment control.

1.2 SUBMITTALS

A. Submit manufacturer’s catalog data and installation instructions for all applicable erosion/sediment control products.

B. Certification and Sampling: The Owner's Representative reserves the right to sample and test any material offered for use. Acceptance will be based on the certification and the results of any tests the Owner's Representative may perform.

PART 2 PRODUCTS

2.1 MATERIALS

A. Erosion Control

1. Disturbed areas of the construction site that will not be redisturbed for 21 days or more must initiate temporary or permanent erosion control measures by the 14th day after the last disturbance, except as precluded by snow cover. In the event of snow cover, erosion control measures must be initiated as soon as practical thereafter. The following erosion controls will be used on the site.

   a. Temporary seeding shall be in accordance with the Urban Standard Specifications for Public Improvements Manual (SUDAS), Division 9 – Site Work and Landscaping, Section 9010 – Seeding.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

1) Type 4 seed mixture (Urban Temporary Erosion Control Mixture): Short lived (6 to 8 months) mix for erosion control.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Application Rate lb/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPRING – March 1 – May 20</td>
<td></td>
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<tr>
<td>Oats*</td>
<td>65</td>
</tr>
<tr>
<td>Annual ryegrass</td>
<td>40</td>
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<tr>
<td>SUMMER – May 21 – August 14</td>
<td></td>
</tr>
<tr>
<td>Oats*</td>
<td>95</td>
</tr>
<tr>
<td>Annual ryegrass</td>
<td>50</td>
</tr>
<tr>
<td>FALL – August 15 – September 30</td>
<td></td>
</tr>
<tr>
<td>Oats*</td>
<td>65</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>40</td>
</tr>
</tbody>
</table>

b. Erosion Control Blanket

1) Erosion control blanket shall be North American Green Double Net, model SC1450BN or approved equal.

2. All temporary erosion controls shall be removed and disposed of as needed to accommodate final site restoration.

B. Sediment Control

1. Practices used on the construction site to divert flows away from disturbed areas, to store flows, or to limit the discharge of pollutants from the site to the degree attainable.

a. Compost Filter Tube: Shall be in accordance with the Urban Standard Specifications for Public Improvements Manual (SUDAS), Division 9 – Site Work and Landscaping, Section 9040 and meet all of the requirements of this Section.


2) Strength: The strength of the material shall be sufficient to prevent tearing, ripping, or other significant damage throughout the intended period of use.

3) Biodegradability: The tube shall be made of natural materials that are biodegradable. Products shall begin to break down in approximately six months.

4) Filter Material:

a) Use material derived from wood, bark, or other non-toxic vegetative feedstocks.

b) Use material with no visible admixture of refuse or other physical contaminants, nor any material toxic to plant growth.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

c) Use material meeting the following particle sizes:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>100</td>
</tr>
<tr>
<td>1&quot;</td>
<td>90-100</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>0-30</td>
</tr>
</tbody>
</table>

b. Stabilized Construction Entrance / Contractor Staging and Laydown Area
   1) Maintain existing pavement or provide 6" thick layer of 3" clean macadam stone.
   2) Install TenCate Marafi RS380i geotextile filter fabric below stone.

c. Intake Protection Bag
   1) Shall be Dandy Bag or Dandy Pop by Dandy Products or approved equal.

d. Intake Protection Bag with Curb Filter
   1) Shall be Dandy Curb Bag by Dandy Products or approved equal.

e. Magnetic Inlet Protection
   1) Shall be Grate Gator Type B by ACF Environmental, Inc. or approved equal.

f. Filter Sack
   1) Filter sack shall be Flexstorm Inlet Filter by Inlet and Pipe Protection, Inc. (IPP) with standard woven bag.

g. Dewatering Bag
   1) Shall be Pump-it Tube by Roughco Inc. model RCPT520 or approved equal.
   2) Shall be used in conjunction with Chitosan Geotextile Treatment Bags.

h. Chitosan Geotextile Treatment Bag
   1) Shall be Floc 500 by Biostar CH or approved equal.
   2) Shall be used in conjunction with Dewatering Bags.

2. All temporary sediment controls shall be removed and disposed of as needed to accommodate final site restoration. Once final stabilization is complete, all sediment controls shall be removed by the Contractor.

PART 3 EXECUTION

3.1 GENERAL EROSION AND SEDIMENT CONTROL REQUIREMENTS

A. General

1. Qualified personnel (provided by the Contractor) shall inspect disturbed areas of the construction site that have not reached “final stabilization” at least once every seven calendar days.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

2. Contractor shall limit the surface area of erodible earth. The Contractor shall provide immediate permanent or temporary erosion/sediment control measures to prevent contamination of adjacent streams of other watercourses, lakes, ponds, or other areas of water impoundment.

3. Contractor shall incorporate all permanent erosion/sediment control features into the project at the earliest practicable time.

4. Minimum erosion/sediment control devices are shown on the plans. It is the Contractor's responsibility to control erosion and sediment on the site. Additional controls shall be installed as required to satisfy this requirement.

B. Limitation of Area Disturbed

1. The surface area of erodible earth material exposed at one time by clearing and grubbing, by excavating, by fill, or by borrow shall be minimized at all times without written approval of the Owner's Representative.

2. The maximum quantity of exposed area may be increased or decreased based on weather conditions, construction procedures or site conditions by Owner's Representative.

C. Rivers, Streams and Impoundments

1. Construction operations in rivers, streams, and impoundments shall be restricted to those areas which must be entered for the construction of temporary or permanent structures.

2. Frequent fording of live streams with construction equipment shall be minimized.

D. Borrow and Waste Areas

1. All on-site borrow and waste areas, shall meet the requirements of the erosion and sediment controls as identified in the SWPPP. Contractor shall provide all erosion/sediment controls as necessary to contain material on site.

3.2 TEMPORARY SEEDING

A. Construction Requirements

1. Seeding will be a continuous operation on all cut and fill slopes, and borrow pits during the construction process. All disturbed areas shall be seeded within fourteen (14) working days after last construction activity.

2. Prepare a seedbed to a depth of 6 inches. Apply 6 inches of topsoil.

3. Roll the area to be seeded with an approved cultipacker.

4. Apply seed with an approved seeder.

5. Roll the seeded area. If the seeded area is relatively flat, the seeding operation is completed.

6. Mulching will be beneficial if the area seeded is steeper than a 3:1 slope or faces south or southwest. The rate of application is 1-1/2 tons per acre or 70 lbs per 1,000 sq ft.

7. Till the mulched area with a mulching tiller.

B. Maintenance

1. The Contractor will be required to water all lawn areas that are seeded within 7 days after seed is spread. The seedbed shall be watered daily to provide the equivalent of 1/8th-in (3mm) of water per day.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

2. The Contractor shall be required to mow and maintain vegetation between 2 and 4 inches in height.

3. The Contractor will be required to replace all seeding that is defective or becomes damaged.

3.3 EROSION CONTROL BLANKET

A. Installation of erosion control blanket shall be in accordance with the manufacturer's specifications and details.

3.4 COMPOST FILTER TUBE

A. Conditions Where Applicable:

1. Slopes less than 10% grade.
2. Around intake structures.

B. Construction Requirements:

1. Pneumatically fill mesh filter tube of size and length as indicated on the plans.
2. Excess tube material shall be tied off and staked at both ends.
3. Maximum compost tube spacing:

<table>
<thead>
<tr>
<th>Tube Diameter (Ft)</th>
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</thead>
<tbody>
<tr>
<td>Slope</td>
</tr>
<tr>
<td>8&quot;</td>
</tr>
<tr>
<td>12&quot; or Greater</td>
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<tr>
<td>0-2%</td>
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<tr>
<td>75'</td>
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<tr>
<td>125'</td>
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<td>2-5%</td>
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<tr>
<td>5-10%</td>
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<tr>
<td>30'</td>
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<td>50'</td>
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</tbody>
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4. Do not use in areas of concentrated flow. Compost filter tubes are only intended to control and filter sheet flow.

5. Compost filter tubes should be placed using "smiles" and j-hooks.

6. In order to prevent water flowing around the ends of compost filter tubes, point the ends upslope to place at a higher elevation.

C. Maintenance

1. The Contractor shall inspect all compost filter tubes immediately after each rainfall event. Any deficiencies shall be immediately corrected by the Contractor.

2. Sediment shall be removed when the control has lost 33% of its capacity.

3. The compost filter tube shall remain in place until the site has been stabilized as determined by the Owner's Representative. Upon removal, the Contractor shall remove and dispose of any excess silt accumulations, grade and dress the area to the satisfaction of the Owner's Representative and establish vegetation on all bare areas in accordance with the contract requirements.

4. Compost filter tubes may be spread out in place as a soil enhancement.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

3.5 STABILIZED CONSTRUCTION ENTRANCE / CONTRACTOR STAGING AND LAYDOWN AREA

A. Maintenance
   1. The condition of the aggregate needs to be monitored daily to prevent tracking or flow of mud onto the surrounding roads, drives, and parking lots.
   2. Accumulation of mud must be removed and more aggregate added as needed.

3.6 INTAKE PROTECTION BAG

A. Conditions where applicable: for use with flat grates (including round) and mountable curbs.

B. Construction Requirements:
   1. Contractor shall install an intake protection bag as shown on the Drawings and at other locations as directed by the Owner's Representative.
   2. Remove grate from frame and slide into intake protection bag.
   3. Tuck the enclosure flap inside to completely enclose the grate.
   4. While holding the lifting devices, place the grate into the frame.

C. Maintenance:
   1. Contractor shall remove all accumulated sediment and debris from the intake protection bag as required.

3.7 INTAKE PROTECTION BAG WITH CURB FILTER

A. Conditions where applicable: for use with flat curb intake frame and grates.

B. Construction Requirements:
   1. Contractor shall install an intake protection bag as shown on the Drawings and at other locations as directed by the Owner's Representative.
   2. Remove grate from frame and slide into intake protection bag.
   3. Tuck the enclosure flap inside to completely enclose the grate.
   4. While holding the lifting devices, place the grate into the frame, street side edge first, then lower edge with cylindrical tube into place. The cylindrical tube should be partially blocking the curb hood opening when properly installed.

C. Maintenance
   1. Contractor shall remove all accumulated sediment and debris from the intake protection bag as required.

3.8 MAGNETIC INLET PROTECTION

A. Installation of magnetic inlet protection shall be in accordance with the manufacturer's specifications and details.

3.9 FILTER SACK

A. Installation of filter sack shall be in accordance with the manufacturer's specifications and details.
SECTION 31 2500
EROSION AND SEDIMENT CONTROL

3.10 DEWATERING BAG

A. Installation of dewatering bag shall be in accordance with the manufacturer’s specifications. This product to be installed in conjunction with the Chitosan Geotextile Treatment Bag.

3.11 CHITOSAN GEOTEXTILE TREATMENT BAG

A. Installation of Chitosan Geotextile Treatment Bag shall be in accordance with the manufacturer’s specifications. This product to be installed in conjunction with the dewatering bag.

END OF SECTION
PART 1 GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Integrally Colored Concrete Sidewalks
   2. Curing of Integrally Colored Concrete: Exterior

1.2 REFERENCES
A. Other useful publications about colored concrete include:
   1. PCA PA124 - Finishing Concrete Slabs with Color and Texture
   2. PCA SP021 - Color and Texture in Architectural Concrete
B. American Concrete Institute (ACI):
   1. ACI 301 - Structural Concrete for Buildings
   2. ACI 305R - Hot Weather Concreting
   3. ACI 306R - Cold Weather Concreting
   4. ACI 316 - Recommendations for Construction of Concrete Pavements and Bases
   5. ACI 302 IR - Recommended Practice for Concrete Floor and Slab Construction
   6. ACI 303.1-97 - Standard Specification for Cast-In-Place Architectural Concrete
C. American Society for Testing and Materials (ASTM):
   1. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete
   2. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete
   3. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete
D. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO M194 - Chemical Admixtures

1.3 SUBMITTALS
A. Contractor shall submit specified manufacturer's complete technical data sheets for the following:
   1. Colored Admixture
   2. Curing Compounds

1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: Manufacturer of specified colored admixture and curing compound shall have a minimum 10 years experience in the production of the specified products.
B. Contractor Qualifications: Concrete work shall be performed by firm with five years experience with work of similar scope and quality.
C. Perform work in accordance with ACI 301 and ACI 316.
SECTION 32 13 16
INTEGRALLY COLORED CONCRETE

D. Conform to ACI 305 during hot weather.
E. Conform to ACI 306 during cold weather.
F. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.
G. Colored Concrete Field Samples:
   1. Within the Contractor staging area, place and finish 5' x 5' field sample panel of each integrally colored concrete type.
   2. For accurate color, the quantity of concrete mixed to produce the sample should not be less than three (3) cubic yards (not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.
   3. Construct sample-using processes and techniques intended for use on permanent work, including stamping, finishing and curing procedures. Include samples of control, construction, and tooled joints in sample panels. The field sample shall be produced by the individual worker who will be performing the work for the project.
   4. Retain samples of cements, sands, aggregates and color additives used in mock-up for comparison with materials used in remaining work.
   5. Accepted field sample provides visual standard for work of this Section.
   6. Field sample shall remain through completion of the work for use as a quality standard for finished work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Colored Admixture: Comply with manufacturer’s instructions. Deliver colored admixtures in original, unopened packaging. Store in dry conditions.

1.6 PROJECT CONDITIONS

A. Colored Concrete Environmental Requirements
   1. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
   2. Avoid placing concrete if rain, snow, or frost is forecast within 24 hours. Protect fresh concrete from moisture and freezing.
   3. Professional practices as described in ACI 305R Hot Weather Concreting and 306R Cold Weather Concreting should be followed.

B. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer’s written recommendations.
PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Colored Admixture for Integrally Colored Concrete

1. Manufacturer
   a. Brickform
      4050 Color Plant Road
      Springfield, IL 62702
      P 217.522.3112
      Toll Free 800.624.0261
      Fax 800.624.3147

2. Materials
   a. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are lime-proof and UV resistant.
   b. Colored admixture shall conform to the following:
      1) ACI 303.1-97 - Standard Specification for Cast-In-Place Architectural Concrete
      2) ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete
      3) ASTM C494 - Standard Specification for Chemical Admixtures for Concrete
      4) AASHTO M194 - Chemical Admixtures

B. Curing Compound for Integrally Colored Concrete: Curing compound shall comply with ASTM C309 and be approved by color additive manufacturer for use with colored concrete.

1. Exterior Colored Concrete
   a. Manufacturer
      1) Brickform
         4050 Color Plant Road
         Springfield, IL 62702
         P 217.522.3112
         Toll Free 800.624.0261
         Fax 800.624.3147

C. Substitutions: The use of any products other than those specified will be considered providing that the contractor requests its use in writing within seven (7) days prior to bid date. This request shall be accompanied by:

1. A certificate of compliance from the material manufacturer stating that the proposed products meet or exceed the requirements for this specification, including standards ACI 303.1-97, ASTM C979, ASTM C494 and AASHTO M194.

2. Documented proof that the proposed material has a ten (10) year proven record of performance, confirmed by at least five (5) local projects that the Design Professional could examine.
SECTION 32 13 16
INTEGRALLY COLORED CONCRETE

2.2 CONCRETE MIX DESIGN
A. A recommended cement content of six (6) sacks per cubic yard of concrete shall be used.
B. Slump of the concrete shall be consistent throughout the project at four (4) inches or less. At no time shall the slump exceed five (5) inches.
C. Calcium chloride shall not be added to the mix since it causes mottling and surface discoloration.
D. Supplemental admixtures, such as additional water-reducing admixtures, waterproofing agents, and super plasticizers shall not be used.
E. Do not add water to the mix in the field.

2.3 COLORS
A. Colored admixture shall be added to the mix per manufacturer's written instructions in a pre-measured bag and shall not be added by weight of cement content.
B. Colored concrete types:
   1. Type 1
      a) Color: Storm Gray (Submit manufacturer's full range of standard color chips for verification prior to pouring Field Samples)
      b) Texture: Standard broom finish
   2. Type 2
      a) Color: Harvest Gold (Submit manufacturer's full range of standard color chips for verification prior to pouring Field Samples)
      b) Texture: Standard broom finish

PART 3 EXECUTION
3.1 SURFACES
A. All surfaces shall be finished uniformly with the following finish:
B. Broomed: Pull broom across freshly troweled concrete to produce medium texture in straight lines perpendicular to main line of traffic. Do not dampen brooms.

3.2 CURING
A. Colored Concrete: Apply curing compound for colored concrete in accordance with manufacturer's instructions using manufacturer's recommended application techniques. Apply curing compound at consistent time for each pour to maintain close color consistency.
B. Curing compound shall be recommended by the same manufacturer as the colored admixture.
C. Precautions must be taken in hot weather to prevent plastic cracking resulting form excessively rapid drying at the surface as described in CIP 5 Plastic Shrinkage Cracking published by the National Ready Mix Concrete Association.
D. The concrete shall never be covered with plastic sheeting.
SECTION 32 13 16
INTEGRALLY COLORED CONCRETE

3.3 TOLERANCES
A. Minor variations in appearance of colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

3.4 FIELD QUALITY CONTROL
A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least 1 composite sample for each concrete mix placed each day.
C. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
D. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
E. Concrete Temperature: ASTM C 1064/C 1064M; 1 test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and 1 test for each composite sample.
F. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
G. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days for information and 2 specimens at 28 days.
   1. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
H. Strength of each concrete mix will be satisfactory if every average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
I. Test results shall be reported in writing to Owner's Representative, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
J. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Owner's Representative.
K. Remove and replace decorative cement concrete pavement where test results indicate that it does not comply with specified requirements.
L. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

PART 1  GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and General Provisions on Contract, including Bidding Requirements, General and Supplementary Conditions and Division I Specifications, apply to work in this Section.

1.2 DESCRIPTION OF WORK
A. The automatic irrigation system when fully completed shall water all noted plant material and vegetated areas illustrated on the landscape plans. Providing the ability to fully irrigate the entire site in a 6 hour maximum water window. It is the intent of the performance specification to install all products within the Owner's property limits and within landscape/turf areas. Limits of irrigation to cover all turf and landscape areas to be defined within the landscape areas - per Landscape Architect. Furthermore all potable irrigation mechanical equipment required by local codes shall be located in the mechanical room under floor drains – see mechanical section.

B. Irrigation contractor to provide all design, labor, materials and equipment required to construct the irrigation system including:
1. Connection to the irrigated areas – coordinate with mechanical plans for connection(s);
2. Valves, mechanical and electrical;
3. Controllers, wireless rain/freeze switch with bypass and all wiring;
4. Sleeving, main/lateral piping; and
5. Pressure compensated drip tubing with self-cleaning emitters.

C. Irrigation system shall be installed as a complete coordinated system. All equipment whether mentioned or not shall be provided for the proper fully automatic operation of irrigation system. Operation shall be as per manufacture recommendations and to the satisfaction of the Owner's Representative. It may be produced by manufacturer's as specified. All system components shall be coordinated to provide a fully compatible functioning system.

D. Stub-out from irrigation to landscape area(s) provided by Irrigation Contractor and performed by mechanical contractor below both finish exterior grades and install a connection at landscape planting areas. Size as required. Coordinate with General Contractor.

E. Provide and install piping and wire sleeves under all paved areas. Both piping and 24 VAC wiring sleeves shall be schedule 80 PVC marked irrigation sleeving. Size, depth, and location as required, (2) sizes larger than piping carried; wire sleeves as per NEC codes. Coordinate with General Contractor.

F. Pre-approved engineer shop drawings with all product submittals shall be provided to Landscape Architect for approval before installation.

1.3 RELATED WORK SPECIFIED ELSEWHERE
A. The Irrigation Contractor shall coordinate with the Landscape Contractor to ensure adequate and timely irrigation of all plant materials and to establish the correct location of irrigation components relative to plant material beds and planters.

1.4 QUALITY ASSURANCE
A. The Contractor shall provide project name, address, contact name and phone number of (3) or more irrigation projects of equal size or greater in nature that have been successfully completed and verified. Owner reserves the right to choose a contractor based upon experience versus low bid.
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

1. Provide resumes indicating recent experience of key personnel who will be supervising installation of this project.

B. Contractor shall coordinate his work with the other trades and in particular Owner's operation.

C. Contractor shall confine his operations to the area to be improved and to the areas allotted him by the Owner for materials and equipment storage.

D. During the work, the Contractor shall erect proper protective devices to warn/or protect pedestrians and maintenance personnel of and from the danger of construction activities.

E. Manufacturing Qualifications

1. Provide the irrigation system as a complete fully automatic unit produced by the manufacturers specified, for the portions of the work including but not limited to: controls, piping, sub-surface drip tubing, quick coupler valves, electric control valves and accessories for the complete operation of an automatic irrigation system. Contractor must purchase materials from an authorized servicing distributor of the products specified.

1.5 DELIVERY, HANDLING, AND STORAGE

A. Materials by single manufacturer shall be delivered to the site in accordance with manufacturer's recommendations for shipment and protection of materials.

B. Handling of materials as recommended by manufacturer.

C. Storage of all materials in locations designated and approved by Owner.

1.6 CODES, INSPECTIONS, AND PERMITS

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

B. The Contractor shall take out all required permits, arrange for all necessary inspections and shall pay any and all fees with expenses in conjunction with the same as a part of the work under this section.

C. If required, the Owner will provide the City and utility companies with a "Hold-Harmless" agreement for sprinklers on public lands and easements.

1.7 SITE DISTURBANCES

A. Take precautions to ensure that installation and equipment do not disturb or damage existing items and elements on public and private property.

B. Verify locations and depths of all underground utilities prior to commencing installation, both public and private.

C. Repair and/or return to original condition any and all damage caused by Contractor's negligence at no cost to the Owner.

1.8 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 this work.

2. 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 full operation. Repair damaged utilities to satisfaction of utility owner.
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

3. 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.

4. Provide minimum of 48-hour notice to Owner and Owner's Representative and receive written notice to proceed before interrupting any utility.

5. Demolish and completely remove from site existing underground utilities indicated to be removed after complete deactivation. Coordinate with utility companies for shut-off of services if lines are active.

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

1.9 GUARANTEE
A. For a period of two (2) years from date of final documented acceptance of work by Owner's Representative, the Contractor shall promptly furnish and install any and all parts and equipment which prove defective in materials, workmanship, or installation at no additional cost to Owner.

B. During the two (2) year guarantee period, the Contractor shall drain the drip system and winterize each fall for the winter and shall put the drip irrigation system back into operation each spring at no additional cost to Owner.

1.10 SUBMITTALS
A. Submit with bid three (3) copies of design build plan(s) with all manufacturer's technical data and specifications for all component parts of the proposed drip system. If products for the site are available on a B.O.M. cutsheet, it must be included with submittals.

B. Submit to Owner three (3) copies of pre-approved design build and installation drawings (shop drawings) for automatic drip irrigation system including plan layout hydraulic and electrical calculations with details illustrating location and type of heads, valves, piping and drip circuits, controls, rain/freeze sensor and accessories.

C. Describe in detail, in the bid for this work, any proposed deviation or variance from the equipment or installation described herein.

PART 2 – PRODUCTS

2.1 GENERAL
A. All pressure compensating drip tubing with pressure regulation and wye strainer, electric valves and controllers shall be Toro/Rain Bird or pre-approved equal; only one product line manufacturer – no mixing of product.

B. All irrigation equipment called out in performance specification must be purchased by the local authorized serviced regional distributor.

2.2 COPPER PIPING - As applicable
A. Hard Copper. -As per local codes (supplied by Irrigation Contractor and performed by mechanical contractor)
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

2.3 P.V.C.
   A. Sizes 1" diameter and larger.
   B. Virgin, high impact, poly-vinyl chloride (P.V.C.) pipe, Schedule 1120-1220. Mainline piping: class
      200, having a minimum of 200 psi working pressure rating. Lateral piping: class 200, having a
      minimum of 200 psi working pressure rating.
   C. Continuously and permanently marked with manufacturer's name, material, size, and schedule or
      type.
   D. Pipe: Conform to CS 207-60 or latest revision.
   E. Material: Conform to CS 256-63 or latest revision.

2.4 P.V.C. PIPE FITTINGS
   A. Sch. 40 P.V.C. solvent weld or belled fittings; saddles prohibited.
   B. Conform to ASTM D1784, ASTM D2466 or latest revision.

2.5 POLYETHYLENE PIPE
   A. Flexible polyethylene pipe rated at 100-psi minimum working pressure.
   B. 1" through 1 1/2" diameter.
   C. Product Standard PS11-69 or ASTM D2239-73 for PE 2306, SDR-15 or latest revision.

2.6 POLYETHYLENE FITTINGS
   A. Schedule 100 P.V.C.
   B. All fittings larger than 1" shall be secured with double stainless steel clamps (downstream of electric
      valves).

2.7 SADDLE TEES
   A. Blazing Saddle self-tapping fitting as manufactured by Blazing Products Inc., St. Louis, MO, or pre-
      approved equal.

2.8 SPRINKLER RISER OFF POLYETHLENE PIPE
   A. Cut-off polyethylene risers mounted on saddle tees.
   B. Riser height as required.

2.9 ELECTRICAL CONTROL VALVES
   A. Manufacturer's standard, of type as follows:-see plan

2.10 CONTROL CABLE
   A. All electrical control and ground wire shall be "UF/PE" direct burial.
   B. 12 ga. "UF/PE" white common neutral 14 ga. "PE" red control wire.
   C. A separate common neutral wire is required from controller along entire main line and dropped in
      marked valve box.
   D. Provide one spare control wire from controller along entire main line.
E. No aluminum wire allowed.

F. Wiring used for connecting automatic remote control valve to automatic controllers shall be type "UF/PE", 600 volt, solid copper, single conductor wire with direct burial insulation and bear "UL" approval for direct underground burial feeder cable.

G. Direct Bury Splice Kit: 3M DBY.

2.11 SUB-SURFACE LOW VOLUME DRIPLINE

A. Sub-surface low volume with integral and evenly spaced pressure compensating, drippers welded to the inside of the tubing at specified intervals and incorporate a copper plate to prevent root intrusion into the water source. Drippers specified (0.9 gallons per hour (GPH)) evenly spaced at 12" centers. Blank tubing is available for non drip areas.

B. Sub-surface tubing shall consist of 17mm, nominal sized one-half inch (1/2") low-density linear polyethylene tubing with pressure compensating, continuously self-cleaning, integral drippers with internal check valve at a specified spacing, (12" centers) or blank tubing without drippers. The tubing shall be brown in color and conform to an outside diameter (O.D.) of 0.66 inches and an inside diameter (I.D.) of 0.56 inches. Individual pressure compensating drippers shall be welded to the inside wall of the tubing as an integral part of the tubing assembly. These drippers shall be constructed of a 2-piece plastic dripper housing containing a continuously self-flushing silicone diaphragm capable of flushing any dirt or debris that may enter the dripper, extending the full length of the dripper. The dripper line shall be installed with an end-of-the-line check valve that will hold the pressure exerted by a 4 ½' column of water (2psi) to ensure it draws water from the center of the water stream thereby ensuring the dripper is always drawing water from the cleanest part of the stream of water flowing through the tubing. The dripper shall also have a built-in physical root barrier whereby the water shall exit the dripper form one location and shall exit the tubing from a second location. This physical barrier shall create an air gap inside the tubing.

C. Each dripper shall have the ability to independently regulate discharge rates, with an inlet pressure of fourteen point seven to seventy (14.7 – 70) pounds per square inch (psi), at a constant flow and with a manufacturer's coefficient of variability (Cv) of 0.03 or less. Recommended operating pressure shall be between 20-50 psi. The dripper discharge rate shall be 0.9 gallons per hour (GPH) utilizing a combination turbulent flow/reduced pressure compensation cell mechanism and a diaphragm. The drippers shall be capable of continuously cleaning themselves while in operation. The dripperline shall be available with 12" spacing between drippers unless otherwise specified. For sub-surface installation, tubing pipe depth shall be minimal depth specified in plans to 6" maximum unless otherwise specified. Maximum system pressure shall be 50 psi. Filtration shall be 120 mesh or finer. Bending radius shall be 7". For installation on top of filter fabric no staples are allowed nor shall any product rupture rubber liner.

2.12 CONTROL EQUIPMENT – Per Submitted Shop Drawings

A. Furnish low voltage system manufactured expressly for control of automatic circuit valves of underground irrigation systems. Provide unit(s) of capacity to suit number of circuits.

B. Exterior Control Enclosure: Manufacturer's standard with locking cover, complying with NFPA 70.

C. Transformer: To convert building service voltage to control voltage of 24 volts.

D. Circuit Control: Each circuit variable from approximately 5 to 60 minutes. Include switch for manual or automatic operation of each circuit.

E. Timing Device: Adjustable, 24-hour and 7 or 14 day clocks to operate any time of day and skip any day in a 7 or 14 day period.

F. Settings: solid state.

G. Coordinate location of controller(s) with Owner.
SECTION 32 8400

IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

2.13 REDUCED PRESSURE BACKFLOW DEVICE – Per Submitted Shop Drawings
   A. Manufacturer’s standard, to suit sprinkler system – coordinate with mechanical trades.

2.14 IRRIGATION METER – Per Submitted Shop Drawings
   A. As required by City of Water Works. Installed by Irrigation Contractor – by licensed plumber.

2.15 QUICK COUPLING VALVES
   A. Located in intervals along all mainline pipe. Verify final locations with Owner
   B. Install quick coupling valve in standard circular valve box.
   C. Provide matching quick coupler keys and ¾” hose swivels. One key for each 3 coupling valves.

2.16 ISOLATION VALVES
   A. Verify final locations with the Owner’s Representative at all change of directions.
   B. Size valve to match line size.
   C. Install isolation valves in 12” standard valve box and located on shop drawings.

2.17 VALVE BOX FOR 24 VAC ELECTRICAL CONTROL VALVES, QUICK COUPLING VALVES, AND ISOLATION VALVES
   A. Single Valve Setup: Carson 12” standard box.
   B. Multi-Valve Setup: Carson’s jumbo box. Use manufacturer’s recommended extension kits if required.
   C. Quick Coupling Valves: Carson’s 10” circular box.

2.18 SLEEVES (under all pavement) - See other section
   A. Coordinate with General Contractor.

2.19 THRUST BLOCK
   A. Pour concrete thrust blocks at all change of directions to ensure against pipe separation.
   B. As shown on construction details.

2.20 WIRELESS RAIN/FREEZE SENSOR – Per Submitted Shop Drawings
   A. Coordinate with Landscape Architect for actual location.

PART 3 EXECUTION

3.1 SYSTEM DESIGN
   A. Location of Drip Tubing: Locate dripperline as per manufacturer's recommendations. Make minor adjustments as necessary to avoid plantings and other obstructions and to provide proper location relative to plant beds, at no additional cost to the Owner. Exact locations of dripperline, valves, and other components shall be established by the Contractor in the field at time of installation and on pre-approved shop drawings.
   B. Minimum Water Coverage: Design to fill up to aggregate level. System total operating time not to exceed 8 hours per 24-hour day.
SECTION 32 8400

IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

C. Minor adjustments to system field layout will be permitted to clear existing fixed obstructions; final field layout shall be acceptable to the Owner based on the pre-approved shop drawings.

3.2 TIMING
A. Coordinate time schedule with Owner's representative.

3.3 INSTALLATION
A. Hand trenching and backfilling: - As applicable; coordinate with all trades
   1. Trenches of sufficient depth and width to permit proper handling and installation of pipe and fittings. Note: all pipe to be secured as to not rise to the surface and assure that no rough edges compromise rooftop membrane.
   2. Lay sub-surface dripline to achieve depths required to provide 2” depth of planting media for piping.
   3. Fill to match adjacent grade elevations with approved planting media. Place and compact fill in layers not greater than 4” depth.
   4. Lay sub-surface trenches and install piping during the same working day. Do not leave open trenches or partially filled trenches open overnight.

B. Sub-surface, fittings, valves and accessories:
   1. Install fittings, valves, sub-surface and accessories in accordance with manufacturer's instructions, except as otherwise indicated.
   2. Obtain Owner's Representative's review and acceptance of depth for proposed sub-surface dripperline and valves prior to installation.
   3. Install fittings and accessories as shown or required to complete the system.
   4. Install controller as detailed:
      a. Coordinate location with Owner and Landscape Architect.
      b. Waterproof wire conduit to provide a complete, waterproof, permanent and neat job.
   5. Install in-ground control valves in a valve access box, cut and modified to adjacent depths as indicated.
   6. Install cut and modified valve access boxes on a suitable base to provide a level foundation at proper grade.
   7. Seal threaded connections on pressure side of control valves as per manufacturer's recommendations.
   8. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by acceptable methods when pipe installation is not in progress and over all non-working hours.

C. Control wiring:
   1. Install electric control cable in the piping trenches wherever possible. Place wire in trench adjacent to pipe. Install wire with slack to allow for thermal expansion and contraction. Expansion joints in wire shall be provided at 200-foot intervals by making 5-6 turns of the wire around a piece of 1/2” pipe instead of slack. Where necessary to run wire in a separate trench, provide a minimum cover of 12”. 
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

2. Provide sufficient slack at site connections at remote control valves in control boxes, and at all wire splices to allow raising the valve bonnet or splice to the surface without disconnecting the wires when repair is required.

3. Connect each remote control valve to one station of a controller except as otherwise indicated.

4. Connect remote control valves to a common ground wire system independent of all other controllers. A separate common neutral wire is required for each controller.

5. Make wire connections to remote control electric valves and splices of wire in the field, using 3M DBY or 3M DBR Direct Bury Splice Kit (or approved equal).

6. Provide tight joints to prevent leakage or water and corrosion build-up on the joint.

D. Interior plumbing: - See other section

1. Install piping to provide complete drainage of the system, toward the source wherever possible. Provide drain valves at all drainage points on pipes. Cut a pipe accurately to measurements established at the building and installed without springing or forcing. After cutting and reaming, and before assembling, remove interior scale, dust, and foreign matter. Installed pipe shall follow building lines, clearing all doors and other openings. No diagonal piping will be accepted. Install piping to allow installation of 1" thickness pipe installation covering. Provide for thermal expansion and contraction of pipe.

2. Insulate piping with 1" thickness of fibrous glass insulation, 35 degree service, with white kraft paper jacket and .001" aluminum foil vapor barrier.

3. All plumbing shall conform to all local codes and regulations.

E. Sleeves: Coordinate with General Contractor:

F. Flushing, testing, and adjustment:

1. After dripperline is installed, open control valves and flush out the system with full head of water to open end flush points.

2. Perform system testing upon completion of each section. Make necessary repairs and re-test repaired sections as required.

3. Adjust run times after installation for proper and adequate distribution of the water over the drip patterns.

4. Adjust all electric remote control valve flow control stems and pressure regulation valves for system balance.

5. Test and demonstrate the controller by operating appropriate day, hour, and station selection features as required to automatically start and shut down irrigation cycles to accommodate plant requirements and weather conditions.

3.4 AS-BUILT DRAWING

A. Furnish accurate reproducible "As-Built" drawings of all components. State the size, manufacturer, model number, part number, size, and exact location of each and every item furnished and installed by this Contractor. Final payment can be withheld until "as-built" has been provided to the Owner and approved by Owner or Owner's Representative.

B. Contractor will furnish Owner with 3 bound copies of instruction sheets and parts lists covering all operating equipment.
SECTION 32 8400
IRRIGATION SYSTEM – PERFORMANCE SPECIFICATION

3.5 DISPOSAL OF WASTE MATERIAL
A. Stockpile, haul from site, and legally dispose of waste materials, including unsuitable excavated materials, rock, trash, and debris.
B. Maintain disposal route clear, clean and free of debris.
C. Repair any damage resulting from irrigation system installation.

3.6 ACCEPTANCE
A. Test and demonstrate to the Owner the satisfactory operation of the system free of leaks.
B. Instruct the Owner in the operation of the system, including adjustment of drip zones, controller, valves, and rain/freezer sensor.
C. Upon acceptance, the Owner will assume operation of the system.

3.7 SPECIAL INSTRUCTIONS
A. The Irrigation Contractor shall coordinate and cooperate with the General Contractor, Mechanical/Electrical Contractors, and all subcontractors, during the installation of this system.
B. During the bidding period, the Irrigation Contractor shall inform the Bidding General Contractors of any system items or elements that are required for fully automatic and complete operation of the system specified herein, that are not being furnished and installed by the Irrigation Contractor.
C. The landscape drip irrigation system must be in full operation by the time the new plant material is placed. It is the intent and mandatory requirement that the sub-surface drip tubing be installed before the plant material and provide the water for the new landscaping.

END OF SECTION
SECTION 32 9100
LANDSCAPE PLANTING

PART 1 GENERAL

1.1 WORK INCLUDED
A. The Contractor shall furnish all labor, materials, tools, equipment, supervision, and services necessary to install plant material, preparation of soil, fine grading, planting, mulching, guying, pruning, watering, edging, and the proper disposal of any excess earth or debris all in accordance with the accompanying Drawings and these Specifications.

1.2 RELATED SECTIONS
A. 31 2001 Earthwork
B. 32 9200 Seeding

1.3 QUALITY ASSURANCE
A. Regulatory Requirements
1. Comply with applicable requirements of Federal, State, and Local laws, regulations and codes having jurisdiction at the project site. The Contractor shall take out all required permits, arrange for all necessary inspections and shall pay any fees and expenses in conjunction with the same as a part of the work under this section.
2. Contractor shall be responsible for certificates of inspection of plant material that may be required by Federal and Local authorities to accompany shipments of plants.
3. The entire installation shall fully comply with all local and state laws and ordinances and with all the established codes applicable thereto.
4. Local zone hardy plant material shall be utilized.
B. Reference Standards
1. "Standardized Plant Names" by the American Joint Committee of Horticultural Nomenclature.
2. "American Standard of Nursery Stock" by the American Association of Nurseryman current edition. Standards: All plant materials, methods, etc., are to conform to the Standards of the American Association for Nursery Stock. In the event there is a discrepancy between these standards and this Specification, the most restrictive requirement shall govern.
3. Nomenclature: The names of plants required under this Contract conform to those given in the "Standardized Plant Names", current edition, prepared by the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein conform generally with names accepted in the nursery code.
C. Observation of Plant Material
1. The nursery supplier photograph representative samples all plant material to be delivered to the site. Photographs shall be sent to the Owner and/or Owner's Representative and Contractor for review and coordination.
2. At the time the plant material is delivered to the job site, the Contractor shall be responsible to observe plant material and reject any material that does not meet standards detailed in ANSI Publication Z60.1-current edition standards and Section 2.4 of this specification. Plant material shall be unwrapped in order to thoroughly inspect trunk, bark, branches, rootball, leaders and form. If material is rejected it shall be sent back to the nursery at the time of delivery at no additional charge to the owner or contractor.
SECTION 32 9100

LANDSCAPE PLANTING

3. The Owner and/or Owner's Representative shall be notified of plant observation times at least 3 days prior by the Contractor once plant delivery has begun.

D. Coordination

1. Work in conjunction with other trades as directed, taking all reasonable precautions to avoid disturbance or interference with any other operation or installation on the site. Contractors shall be responsible for the cost of replacing any material damaged as a result of his/her negligence.

2. Observation: The contractor assumes responsibility of the condition of the earthwork including final grades/elevations and quality including lack of debris, clumps and rocks. If the earthwork is not acceptable, the landscape contractor shall not commence planting operations and shall notify the Owner and/or Owner's Representative and Construction Manager.

E. Points of Observation: The Contractor shall notify the Owner and/or Owner's Representative at least five (5) days prior to start of work, inspections, or delivery to the Project Site to allow for inspection scheduling for each of the following work activities listed below. The notice must be sent via confirmable email or facsimile transmission to the Owner and/or Owner's Representative.

1. Pre-Installation Meeting: The Contractor shall meet with the Owner and/or Owner's Representative to review schedule, submittals, and project expectations. This meeting shall occur at least 10 days prior to the start of any work or deliveries to the job site.

2. 1st Observation Meeting: The Contractor shall notify the Owner and/or Owner's Representative 5 days in advance for review on plant stock delivery, balled and burlapped tree planting procedures, plant bed preparation, and other review. This meeting shall occur before planting begins to ensure beds are correct and the proper planting procedures are followed and layout of plant material is per plan.

3. Final Observation Meeting: The Contractor shall notify the Owner and/or Owner's Representative 5 days in advance for review of complete installation. A punchlist by the Owner and/or Owner's Representative shall be created and sent to the Contractor and Owner to coordinate any clean up, plant replacement, and repair.

4. Initial Planting Acceptance: Refer to PART 3 –Section 3.7 for requirements.

5. Final Planting Acceptance: Refer to PART 3 –Section 3.7 – The Contractor shall submit a written request to the Owner and/or Owner's Representative for site inspection at least fourteen (14) days before the anticipated date of observation.

1.4 SUBMITTALS

A. Contractor shall submit the following to the Owner and/or Owner's Representative at least thirty (30) days prior to start of the work

1. The source and supplier of all plant material, planting schedule, fertilizer, hardwood mulch, soil amendments and other materials along with the type of equipment to be used on this project.

B. Grower's Certificates: Proof of certification of Nursery Stock Grower and Dealer Inspection as well as any other certificates required by governmental authorities.

C. Fertilizer Manufacturer's Certificate of Compliance: Written documentation verifying compliance with chemical analysis of fertilizer furnished. Submit to Owner and/or Owner's Representative 5 days prior to delivery.
SECTION 32 9100

LANDSCAPE PLANTING

D. Substitutions: Substitutions of plant material will not be permitted unless authorized in writing by the Owner and/or Owner's Representative. If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract Price. Such proof shall be substantiated and submitted in writing to the Owner and Owner and/or Owner's Representative at least thirty (30) days prior to start of the work under this Section. These provisions shall not relieve the Contractor of the responsibility of obtaining specified materials in advance if special growing conditions or other arrangements must be made in order to supply specified materials.

1.5 STORAGE, HANDLING, AND DELIVERY

A. Storage of Materials

1. All materials delivered to the job shall be stored so as to keep them in new condition and free from deterioration. Fertilizer, etc., shall be stored in temporary sheds off-site at Contractor's expense.

2. All nursery stock must be kept secure, cool, and moist while being stored. If storing B&B plants on site, store in either a refrigerated truck or heeled into soil or mulch.

B. Packaged Materials

1. Deliver packaged materials in unopened containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

C. Plant Material

1. Plants shall not be delivered to the site until the corresponding beds are fully prepared and approved. Vegetated material shall be inspected upon delivery at job site by the Contractor. All materials must arrive with identification labels calling out the size and species name. All plant material is subject to rejection by the Contractor, Owner and/or Owner's Representative either at time of delivery or at the initial inspection, provided it does not comply with the requirements stated herein. Any rejected stock shall be immediately removed from the premises and replaced with approved stock at no cost to the Owner.

2. All plant tags shall stay on plants through planting and shall NOT be removed until Owner and/or Owner's Representative has performed the initial inspection. The plant tags shall be removed, collected, and provided to the owner once Initial Inspection is completed.

1.6 JOB CONDITIONS

A. Examination of Site:

1. The bidder must acknowledge that he has examined the site, Drawings and Specifications and the submission of a quotation shall be considered evidence that examinations have been made.

B. Field Conditions: The Contractor shall verify drawing dimensions with actual field conditions and inspect related work and adjacent surfaces. The Contractor shall report to the Owner and/or Owner's Representative all conditions which prevent proper execution of this work. The Contractor agrees to be fully responsible for any and all damage which might be occasioned by the Contractor's failure to exactly locate and preserve any and all utilities and structures.

1.7 SEQUENCING/SCHEDULING

A. Planting Time: Proceed with and complete planting as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.

B. Allowable Planting Dates:
SECTION 32 9100
LANDSCAPE PLANTING

1. Evergreen Plants: September 1 to October 15 and prior to June 1, but not after candles exceed 1 inch.

2. Deciduous Plants (Balled and Bur-lapped and Container): August 15 to November 15 or the 1st frost of the season and in the spring prior to June 1

3. Perennials: August 15 to October 15 and prior to June 1.

4. Weather Restrictions: Planting may be conducted under unseasonable conditions, except in weather below 32 degrees or above 90 degrees. No variance from plant warranty or other requirements will be given for plants installed outside the specified period.

1.8 MATERIALS CLEAN-UP

A. The Contractor shall keep the premises free from rubbish and all debris associated with their work at all times and all unused materials and debris shall be removed from the site.

PART 2 MATERIALS

2.1 PLANTING SOIL MIXTURE

A. All areas indicated to receive plant material shall receive a minimum of 12" of planting soil. If suitable topsoil is in place, amend the top 12" to conform with this section.

B. Planting soil for planting holes and beds shall consist of compost thoroughly mixed with the in place cultivated soils. Soil excavated from planting pits that is similar in nature to topsoil and is determined to be suitable for planting soil shall be thoroughly mixed with one (1) part compost to four (4) parts of existing soil.

C. Very poor soils of clay, gumbo, gravel, hard-pan, or other soils injurious to plants shall not be used.

D. If quantity of soil excavated from planting pits is not adequate for planting, furnish planting soil consisting of partially decomposed vegetable matter of natural occurrence black, clean, low in content of mineral or wood material, mildly acidic, fertile, and friable. Mix with one (1) part of compost to four (4) parts of soil.

E. Dispose of soil excavated from planting hole that is determined not to be of quality required or is not needed to be used for planting soil.

2.2 FERTILIZER

A. All fertilizers shall be horticultural grade complete formula fertilizers and shall conform to the applicable State Fertilizer Laws. Fertilizer shall consist of uniform dry granulated nutrients produced by mining and manufacturing processes and commonly used in the agricultural or lawn care industries. It shall contain the three major plant nutrients of nitrogen, phosphorous, and potassium. Commercial fertilizer may be furnished as a homogenous or blended form. Submit product information for Owner and/or Owner's Representative approval.

B. Slow release fertilizers: A minimum of 70 percent of the nitrogen component shall be a slow release water insoluble nitrogen.

2.3 PLANT MATERIALS

A. Plant Schedule: A list of plant materials is scheduled on the Drawings. In the event of any discrepancy between this schedule and the Plan Drawing showing the plants, the Plan Drawing shall govern.
SECTION 32 9100
LANDSCAPE PLANTING

B. Certification of inspection of plant materials required by Federal, State, or other governmental agencies to accompany all shipments to be furnished to the Owner and/or Owner's Representative. Plants shall have been grown under climatic conditions similar to those in the locality of the project.

C. Planting stock shall be well-branched and well formed, sound, vigorous, healthy, free from disease, sun-scale, windburn, abrasion, and harmful insects or insect eggs; and shall have healthy, normal unbroken root systems. Deciduous trees and shrubs shall be symmetrically developed with branches of uniform growth, with straight trunks and central leaders, and free from objectionable disfigurements. One-sided branching plant material will be rejected.

D. Evergreen trees and shrubs shall have well-developed symmetrical tops with typical spread of branches for each particular species or variety. Evergreen leaders shall be straight and central. Evergreen trees and shrubs shall not be sheared.

E. Stock Sizes: All stock measurements - caliper, height, branching level, number of canes, ball sizes shall be in strict accordance with the latest edition of the American Standard for Nursery Stock, unless otherwise noted on the plans. Plants used on the project shall meet or exceed all minimum requirements indicated in the size, condition, and remarks sections of the planting legend on the plan sheets.

F. Provide plants free of the following:
   1. Harmful insects, insect eggs, borers, and all forms of infestation
   2. Plant diseases and moldy or dried roots
   3. Damage to trunk, bark, branches, leaders, root systems, or cut-leaders
   4. Defects, disfiguring knots, sunscald injuries, and frost cracks
   5. Rodent or deer damage to bark and buds

G. Plants with broken or cut back terminal leaders will be rejected. Plants with crooked or split leaders will be rejected.

H. All stock shall be balled and bur-lapped or container grown stock. Bareroot stock of any kind is unacceptable.

I. All plant material must be watered the same day it is planted in order to comply with these Specifications.

J. Delivered trees with more than 4" or more of soil over the root flare shall be rejected. If after carefully removing the soil over the trunk flare unveils encircling or excessive roots and/or unhealthy conditions the tree will be rejected. The trunk of the tree shall not be more than 10% off center within the rootball. The Contractor, Owner and/or Owner's Representative may open soil balls to inspect for root condition, size, balance, and trunk location within the ball.

K. Ornamental grasses and perennials shall be inspected by root mass and top growth. Containers shall be removed to ensure roots have grown to the width and the depth of the container and have a solid root mass per ANSI standards to hold the soil ball intact. If root mass is undersized the plant shall be rejected. 1 gallon container plants shall also have a minimum of 6" vertical height.

2.4 MULCHES

A. Double Shredded Hardwood Mulch shall be used in planting beds:
   1. Locally obtained or a proprietary product.
SECTION 32 9100
LANDSCAPE PLANTING

2. Shredded hardwood mulch as approved by the Owner and/or Owner's Representative. No artificially colored mulch will be accepted.

3. All plantings require hardwood mulch to a depth as detailed, unless otherwise noted on drawings.

4. All areas to receive mulch shall have weed barrier.

2.5 WEED BARRIER
A. Provide a chemical base weed prevention plan for all planting beds. Apply once installation is complete.

2.6 STAKING MATERIALS
A. Stakes for tree support shall be steel "T" bar fence post, 6' long, painted dark green with the top 6" painted white.
B. Hose shall be reinforced garden hose no less than \( \frac{1}{2} \)" inside diameter or fabric straps or other material approved by the Owner and/or Owner's Representative. Provide hose of adequate length to prevent contact of staking or guyng wire with tree trunk.
C. Provide wire of sufficient gauge to resist breaking during high winds.

2.7 WATER
A. Water shall not contain elements toxic to plant life. It shall be the Contractor's responsibility to obtain water to be used for watering of plant material. The Contractor shall coordinate with the Owner to locate the best area for water connection.
B. Provide watering as needed to keep trees in a thriving and healthy condition. Watering shall slowly soak into the ground via hand watering, a Treegator bag or other approved method.
C. The transition of maintenance responsibilities shall be summarized by the Contractor and provided in written form to the Owner once the Contractor has fulfilled work requirements to ensure watering and maintenance care keeps plants in a thriving condition.

PART 3 EXECUTION
3.1 GENERAL PREPARATION
A. Protection of Existing Vegetation
   1. All areas under drip lines of existing trees shall be kept free of construction equipment, trailers, material storage, and vehicles.
   2. Exercise extreme care when working around existing trees to remain. No soil scarification or compaction from construction vehicles shall occur under any existing critical root zone.

3.2 TREE, SHRUB, AND PERENNIAL INSTALLATION
A. All planting shall be performed by personnel familiar with the accepted procedure of planting and under the constant supervision of a qualified planting foreman.
B. All planting is to be done as shown on drawings and as specified herein and in strict accordance with standard horticultural practices.
C. Preparation of Planting Mixture and Beds
SECTION 32 9100

LANDSCAPE PLANTING

1. Plant material locations and planting bed outlines shall be staked on the project site by the Contractor and approved by the Owner and/or Owner's Representative before any plant pits or beds are excavated. Plant material locations and bed outlines may be adjusted by the Owner and/or Owner's Representative to meet field conditions.

2. Mix recommended soil amendments and fertilizers with topsoil at recommended rates. Delay addition of fertilizer if planting mixture will not be used within two (2) days.

3. Planting beds shall be cultivated to a minimum depth of 12".

4. The Contractor shall be responsible for testing percolation rates to measure adequate drainage in the planting area. Where trees, shrubs, or perennials are planted a test bed shall be prepared with the location selected by the Owner and/or Owner's Representative. A percolation test shall be conducted by filling a 16" deep planting hole with water and measuring the time it takes for the water to drain. Adequate drainage will be considered equal to or greater than a percolation rate of ½" per hour. In case of inadequate drainage, the Owner and/or Owner's Representative shall be notified. Beds shall be free of rocks larger than one inch diameter, weeds, scrap material, and objectionable materials. Beds shall also demonstrate proper incorporation of soil additives.

D. Installation of Trees, Shrubs and Perennial.

1. Planting pits shall be excavated to produce vertical sides and flat bottoms. Scarify side walls to alleviate glazing and loosen any hard subsoil in bottom of pit. Minimum pit sizes shall be as shown on drawings.

2. Dispose of all subsoil, clay, and rock (off-site) removed from planting excavations. The top six (6) inches of topsoil excavated from the planting pit, if free from subsoil, clay, rocks, roots, or other debris, may be utilized in the topsoil mixture as specified.

3. Setting Plants
   a. The Contractor shall install the first balled and bur-lapped tree with the Owner and/or Owner's Representative present to ensure proper planting methods. Refer to planting details and specifications for the proper planting procedure of hole preparation and removal of all twine, wire cage and other trappings of the root ball. Root ball crowns shall also be set so that they are 2" higher than the surrounding grade to ensure the root flare is slightly above grade.
   b. Ball and bur-lapped and container grown plants shall be handled and moved only by the ball or container. Remove all the wire cage and burlap except for 1/3 of the bottom before placing root ball in the ground. Inspect rootball to ensure specifications are met in Section 2.4. Plants shall be set plumb and held in position until a sufficient quantity of planting soil mixture has been firmly placed around roots or ball. Once the tree is stabilized in the planting hole, carefully remove burlap, twine, and all other trappings as much as possible before partially backfilling. Trees shall be watered in allowing water to completely soak into ground after partial backfill.
   c. The remainder of backfill of planting soil mixture shall be tamped and watered.
   d. Container-grown stock shall be removed from containers without damaging plant or root system. Planting shall be completed as specified for balled or bur-lapped plants.

4. Double Shredded Hardwood Mulching
   a. Mulch for planting beds shall be installed to a minimum depth of three inches (3") in all planting bed areas as noted on the drawings. Mulch for all tree plantings shall be (3") in depth.
SECTION 32 9100

LANDSCAPE PLANTING

b. Mulching shall take place within 48 hours after planting.

c. Weed barrier shall be placed prior to planting and placement of mulch.

d. Mulch shall be kept out of the crowns of shrubs and off walls, sidewalks, light standards, and other structures.

e. Mulching and weed barrier shall be considered incidental to the overall project. No additional compensation shall be allowed.

5. Staking and Guying

a. When applicable, plants shall be staked and guyed as indicated on plans within 24 hours of planting.

b. Stakes shall be driven vertically into the ground to a depth specified in details and in such a manner as not to damage the ball or roots.

c. All deciduous trees greater than two and one half inches (2 1/2") caliper shall be staked with three metal "T" stakes, spaced equal distant around the tree.

d. All evergreen trees shall be staked with two metal "T" stakes, spaced on either side of the tree.

e. Staking and guying shall be considered incidental to the overall project. No additional compensation shall be allowed.

6. Pruning: The Contractor shall prune new plant material in the following manner: Dead and broken branches shall be removed. Evergreen plants shall not be thinned out or sheared. Shrubs shall not be sheared. All plants shall meet or exceed the minimum requirements indicated in the size, condition, and remarks sections of the planting legend on the plan sheets after pruning has taken place. Cuts shall be made with sharp instruments and shall be in compliance with ANSI A300 Pruning Standards. "Headback" cuts at right angles to line of growth shall not be permitted. All trimmings shall be removed from the site.

a. Pruning shall be considered incidental to the overall project. No additional compensation shall be allowed.

7. Wrapping: The Contractor shall wrap trees in the fall to help prevent sun scald and frost cracks unless otherwise directed by Owner and/or Owner's Representative. 4 inch wide bituminous impregnated tape, corrugated or crepe paper, specifically manufactured for tree trunk wrapping, having qualities to resist insect infestation, or similar material approved by the Owner and/or Owner's Representative. Wrapping shall overlap about 33 percent with each turn and fastened with twine. All wrap and twine shall be removed in spring.

8. Watering: The Contractor is responsible for maintaining adequate, but not excessive, soil moisture for plants installed. Watering must respond to varying seasonal conditions, soil types, and drainage. Water must thoroughly soak the entire root area rather than dampen the soil surface.

9. Initial inspection of the planting to determine completion of contract work, exclusive of possible replacement of plants, will be made by the Owner and/or Owner's Representative upon completion of the work. All plants shall be alive, healthy and in a vigorous growing condition at the time of initial acceptance. The Contractor shall notify the Owner and/or Owner's Representative when initial installation is complete.
SECTION 32 9100
LANDSCAPE PLANTING

3.3 INSTALLING MULCH
A. Mulching
1. The top of all areas of mulch cover shall be 1/2" below the top of adjacent curb, walk, wall, wall cap, or edge of pavement.
2. Weed prevention and mulching shall be considered incidental to the overall project. No additional compensation shall be allowed.

3.4 WARRANTY AND REPLACEMENT
A. Plant material shall be warrantied for 1 full year after Initial Planting Acceptance and shall be alive, in good health, and in satisfactory condition at the end of warranty period.
B. Any plant required under this Contract that is dead or not in a vigorous, thriving condition, as determined by the Owner and/or Owner’s Representative at the time of Final Planting Acceptance, will be removed from the site.
C. Plants that are missing or rejected at the time of Final Planting Acceptance are to be installed during the specified planting season when weather and site conditions permit.
D. After Initial Planting Acceptance, replace plants (once during or at the end of the warranty period) that are observed to be dead or in a badly impaired condition. One replacement after initial acceptance shall constitute fulfillment of Contractor’s warranty for the particular plant replaced.
E. Replacement Plants: Plants of the same kind and size as specified in the Plant Schedule; furnished and planted as specified herein. Guyed or staked, mulched, fertilized, pruned, wrapped and restored to original condition as originally specified at no cost to Owner.
F. Replacement cost shall be borne by Contractor except for possible replacements resulting from loss or damage due to occupancy at project in any part, vandalism, civil disobedience, acts of neglect on the part of others, physical damage by animals, vehicles, fire, or losses due to curtailment of water by local authority, or to “Acts of God”. Droughts, floods, tornadoes, winds of hurricane force, and hail are not normal and the damage they do cannot be calculated in a bid.

3.5 ACCEPTANCE
A. Planting acceptance shall be based upon the following criteria:
1. All requirements for the completed installation and maintenance have been provided.
2. Clean-up operations are completed.
3. Plants shall be well-branched and well-formed alive, healthy, and in a vigorous growing condition at the time of final acceptance.
B. Five (5) days prior to the anticipated date of Initial Planting Acceptance, submit written notice requesting inspection to the Owner and/or Owner’s Representative.
C. Fourteen (14) days prior to the anticipated date of final inspection and end of the one year warranty period, the Contractor shall submit written notice requesting inspection to the Owner and/or Owner’s Representative and Construction Manager.
D. Initial Planting Acceptance of the landscape to determine completion of contract work, exclusive of possible replacement of plants, will be made by the Owner and/or Owner’s Representative upon completion of work. Initial inspection will not be conducted unless all items of work as outlined in PART 3 – EXECUTION have been completed.
SECTION 32 9100
LANDSCAPE PLANTING

E. After each Initial and Final Planting Acceptance observations, the Contractor will be notified in writing by the Owner and/or Owner’s Representative, of acceptance of the work exclusive of the possible replacement of plants and correction of deficiencies in the requirements for completion of the work.

END OF SECTION
SECTION 32 9200
SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES
A. This part of the Specifications includes providing labor, materials, equipment, and supervision required to provide seeding.

1.2 RELATED SECTIONS
A. Section 32 9100 Landscape Planting.

1.3 QUALITY ASSURANCE
A. Seeding is to be installed by a firm specializing in seeding as specified.
B. Source Quality Control: Ship seeding materials with certificates of inspection required by governing authorities. Comply with regulations applicable to seeding materials.
C. Do not make substitutions. If specified material is not obtainable, submit proof of non-availability to Owner’s Representative, together with proposal for use of equivalent material.
D. Analysis and Standards: Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

1.4 SUBMITTALS
A. Seed vendor’s certified statement for each grass seed mixture required, stating botanical and common name, percentages by weight, and percentages of purity, germination, and weed seed for each grass seed species. Submit method of installation for approval by Engineer.
B. Fertilizer: Submit certification of the fertilizer analysis with scale weight and statement of guaranteed analysis. Submit from a certified fertilizer dealer, a mechanically printed commercial fertilizer label, or bill of lading.
C. Hydromulch: Submit product information for approval by Engineer.
D. Seeding Schedule: Proposed seeding schedule, indicating dates for seeding work during normal seasons. Once accepted, revise dates only as approved by Owner’s Representative in writing, after documentation of reasons for delays.

Dates for this work are as follows:
Fall: August 15 – October 15
Spring: March 15 – May 31

E. Any deviations from this schedule must be approved by the Owner’s Representative. Maintenance and warranty conditions may be impacted by such deviation.
F. Furnish detailed written recommended maintenance program to the Owner with a copy to the Owner’s Representative, prior to final inspection of the seeding.

1.5 DELIVERY, STORAGE AND HANDLING
A. If seed is mixed prior to delivery on the site, it shall be tagged showing a guaranteed statement of composition of mixture and percentage of purity and germination of each variety.
B. If seed is to be mixed at the site, it shall be delivered in original containers bearing producers certification of germination and purity.
C. Tags shall show producers or dealers Illinois Permit Number and date of testing; test date shall be no more than 90 days previous to time of use.
SECTION 32 9200
SEEDING

D. Fertilizers shall conform to State of Illinois laws and regulations. If delivered in bulk, bills of lading or other labels shall be furnished to the Engineer or labels indicating analysis and weight information from each container shall be preserved and furnished to the Engineer within twenty-four (24) hours of application.

E. Handling of materials as recommended by manufacturer.

F. Store all packaged materials off ground and protect from moisture.

G. Storage of all materials in locations designated and approved by Owner’s Representative.

1.6 JOB CONDITIONS

A. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required.

B. Grade Stakes: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

C. Protection: Protect existing irrigation system, structures, utilities, sidewalks, pavements, and other facilities during seeding operations. Repair any damage at no cost to the Owner.

1.7 SEQUENCING AND SCHEDULING

A. Planting Time: Proceed with, and complete seeding as rapidly as portions of site become available, working within seasonal limitations for each kind of seed required. Contractor shall seed to allow proper germination within a 7-10 day period free from heavy rainfalls. The establishment of the seed will be critical in the detention area. Prevention of ponding to allow seed to establish may be required.

B. Chronological procedure for seeding is to remove any existing vegetation, disc, fertilize, prepare the seed bed, seed, and water.

PART 2 PRODUCTS

2.1 SEEDING MATERIALS

A. Lawn Turf: Provide United Seeds, www.unitedseeds.com “Super Turf II LS” or approved equal seeding at 10.0 lbs/1000 SF.

B. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. All seed shall be Blue Tag Certified. Certified Blue Tag and Analysis Tag shall be on every bag. All bagged seed mixtures shall have a Certified Blue Mixture Tag on each bag.

1. Mix seed to the specified proportions by weight. Use methods approved by the Engineer.

2.2 FERTILIZER

A. Commercial Fertilizer: Commercial grade conforming to current requirements of the Illinois Department of Agriculture, uniform in composition, liquid or dry and free flowing. Refer to United Seeds or approved equal manufacturer’s recommendations and schedule for the first 3 months.

2.3 HYDROMULCH

A. Hydromulch all seeded areas at 3500lbs/Acre. Install per manufacturer’s recommendations.

1. Shall be Flexterra High Performance Flexible Growth Medium (HP-FGM) by Profile Products, LLC or approved equal.
SECTION 32 9200
SEEDING

PART 3 EXECUTION

3.1 PREPARATION FOR SEEDING

A. Strip the surface of any vegetation by scarification. Remove and dispose of scarified vegetation.
B. Lightly disc soil surface to incorporate and loosen to a depth of 6”.
C. Apply 1lb phosphorous/1000 square feet to soil surface.
D. Disc and harrow all areas to be seeded and firm-up loosened seed bed with a light roller.
E. Shape and fine grade to remove rills, water pockets, undesirable vegetation, and irregularities to provide a smooth, firm, and even surface true to grade. Remove all debris greater than ½” from the seedbed.
F. Repair erosion or other damage which occurs during seed bed preparation.

3.2 SEEDING & HYDROMULCHING

A. Prior to seeding, the seedbed will be inspected and approved by the Engineer. Use methods and procedures consistent with equipment manufacturer’s recommendations; however, do not operate ground-driven equipment at speeds greater than 10mph.
B. Sow seed mix at specified rates.
   1. Place all materials in hydraulic mulching equipment specifically manufactured for Flexterra or approved equal.
   2. Seed and fertilizer first. Under no circumstance shall seeding and hydromulching be completed in the same application.
   3. Apply mulching mixture within 1 hour after seed and fertilizer are placed in the hydraulic seeder. If necessary, dampen dry, dusty soil, to prevent balling of the material during application. Apply the slurry evenly over all specified areas at component material rates specified. Flexterra or approved equal: Minimum 3,500 lb/acre dry weight.

3.3 MAINTENANCE

A. Begin immediately following installation.
B. To include:
   1. Repair of eroded or damaged areas prior to acceptance.
C. Until initial acceptance and approval is received, reseed or overseed, using seed mix originally specified. All seeded areas shall produce uniformity.

3.4 OVER SEEDING & REPAIR OF LAWN AREAS

A. Repair disturbed areas for seeding by tilling, shaping, and raking as required.
B. Over seeding of seeded areas should be accounted for as part of this contract at rates approved by manufacturer.

3.5 CLEANUP AND PROTECTION

A. During seeding work, keep pavements clean and work area in an orderly condition. Clean all paved surfaces open for public use at the end of each day and prior to forecasted precipitation.
B. Upon completion of job, clean-up all debris, caused by work, and excess material and leave area within contract limits in a neat and clean condition.
3.6 INSPECTION AND ACCEPTANCE

A. Upon completion of the work and fulfillment of the requirements of this Section, notify the Owner's Representative in writing that the work is ready for final inspection. Request a definite date for final inspection that is no sooner than 60 days from the date that all activities were completed.

B. Notify the Owner's Representative five (5) days prior to the requested final inspection date.

C. Acceptance Requirements:

1. Seeded areas shall be in a live, healthy, growing, and well-established condition without eroded areas, bare spots, weeds, undesirable grasses, disease, or insects.

2. Seeded areas shall have a dense uniform stand of lawn/grass growing not less than 95 percent of the overall area and with no individual bare spots larger than 3 inches in size and no concentrations of bare spots.

D. Reseed and maintain all seeded lawn areas which do not meet the requirements of this Section at the time of final inspection.

E. Replacement work shall be as specified for original seeding.

F. Replacement work shall be re-inspected before acceptance.

G. Replacement cost shall be borne by Contractor except for possible replacements resulting from loss or damage due to occupancy at project in any part, vandalism, civil disobedience, acts of neglect on the part of others, physical damage by animals, vehicles, fire, or losses due to curtailment of water by local authority, or to "Acts of God". Droughts, floods, tornadoes, winds of hurricane force, and hail are not normal and the damage they do cannot be calculated in a bid.

END OF SECTION