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<th>SUMMARY OF CHANGES</th>
</tr>
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<td>3/8/10</td>
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Drawings below that pertain to this section are shown here for quick reference. These should be reviewed with the owner prior to being used on BYU projects. Note sitework requirements following Detail C below.

Curb & Gutter Standard

Curb and Gutter Alternate (Only When Specified)
5/8" x 1 3/4" BARS
GRATE = 20 1/4" x 20 1/4" (outside dimensions)

3-3/8" dia. BARS SPACED EQUALLY (4.75" o.c.)
WELDED INTO TOP SLOTS OF GRATE BARS

7-5/8" x 1 3/4" INTERIOR BARS
SPACED EQUALLY (2.45" o.c.)

PLAN VIEW

TYPICAL CURB AND GUTTER

PROVIDE 1/8" CLEARANCE ON GRATING

ANGLE: 1 1/2" x 2" x 1/4" FRAME
21" x 21" (Outside Dimensions)
W/ J BARS WELDED @ CORNERS
AND ANCHORED SECURELY IN CONC.

#4 REBAR @ 12" O.C. B/W'S

SECTION

CATCH BASIN

Brigham Young University
Planning Department
240 BWMID
Provo, Utah 84602
(801) 422-0586

Date: 5/2009

Design: By

Drawing: By

Approved: By

Page 31.C
**Stair Tread Nosing**

Sept. 2, 2010

**American Safety Tread**

*Type 3511*

![Diagram of Type 3511 Stair Tread Nosing](image)

**Type 3511**

[http://www.americansafetytread.com](http://www.americansafetytread.com)

**Wooster Products, Inc.**

*Type 231BF*

![Diagram of Type 231BF Stair Tread Nosing](image)

**Type 231BF**


**STAIR NOTES:**

1. STAIR NOSING SHALL BE AMERICAN SAFETY TREAD (TYPE 3711) OR WOOSTER SAFETY TREAD (TYPE 241BF) OR APPROVED EQUAL. INSTALL TREAD 3” IN FROM BOTH SIDES OF STAIRS OR PER MANUFACTURER RECOMMENDATIONS.

2. ALL EXTERIOR CONCRETE SHALL BE 6% AIR ENTRAINMENT.

3. WHEN REPLACING CONCRETE MATCH EXISTING WIDTH, SLOPE & DIMENSIONS
Sidewalk Contraction Joint Detail
4-way intersection

Note for X:
Spacing between contraction joints shall be no more than 2.5 times in feet to the thickness of the concrete in inches.
SECTION 2-1: ASPHALT PROJECTS

SECTION 2-1-1 GENERAL CONDITIONS

A. The State of Utah Standard Specifications for Road and Bridge Construction, 2005 Edition, shall apply to each and every phase of this project. No deviation will be allowed with the exception of those modifications listed herein.

B. The Standard Contract Requirements, Brigham Young University are hereby made a part of this specification and are to be considered binding as if specifically written into each contract.

Basis of Payment: Payments shall be by actual quantities installed and pricing determined by unit price as determined by the bid proposal.

References

SECTION 2-1-2 AREAS OF CONSTRUCTION

A. Miscellaneous Campus Site Work

SECTION 2-1-3 SCHEDULING AND COORDINATION OF WORK

A. A University employed construction inspector will be available during normal working hours to act as liaison between the contractor and the owner. The contractor shall, without exception, communicate with this inspector concerning scheduling, site clearing, deviation from these specifications, and shall give a minimum of 24 hours notice prior to commencement of work and similar notice if he suspends his work, except for normal non-working days or inclement weather.

B. Small quantities of materials may be accepted without sampling or testing when they conform to the following requirement and procedure:

1. Acceptance on the basis of Visual Examination.

The Owner may accept small quantities on the basis of a visual inspection of the material. This shall be limited to only those materials being furnished from sources of supply which have recently been found satisfactory under normal testing and sampling procedures.
SECTION 2-1-4 ENGINEERING

Stakes for control of both alignment and grade will be furnished by the owner. This will include “red-heading” of all placed base material. These shall be carefully guarded and preserved by the contractor. If, through negligence on the part of the contractor, it is necessary to replace these controls, it shall be done at the contractor’s expense. Apparent errors in either line or grade shall immediately be drawn to the attention of the owner before proceeding with the work.

SECTION 2-1-5 GRADING FOR NEW PAVING

A. Any excess excavation required for areas of new paving shall be excavated, loaded, and hauled away by the contractor. All surplus soil free of unsuitable debris shall be retained on the campus and wasted at the location directed by the owner within a radius of 3 miles. Unsuitable excavation, such as asphalt paving, concrete, etc., shall be the property of the contractor and removed from the campus.

B. All additional fill required for areas of new paving shall be obtained by the contractor. This material shall be loaded, hauled, placed and compacted by the contractor. Fill shall be placed in layers not to exceed eight (8) inches in thickness and thoroughly compacted to at least 95% of the dry density as determined by AASHTO T-180 Method “D”. The original ground on which fill is placed shall be free of all unsuitable material and debris and compacted to 95% of the dry density as determined by AASHTO T-180 Method “D”.

SECTION 2-1-6 NEW BASE MATERIAL

A. All materials and construction procedures shall conform to the State Specifications Section 02721—Untreated Base Course.

B. All base material shall be ¾” (maximum) gradation, and shall be compacted to at least 95% of the maximum dry density as determined by AASHTO T-180 Method “D”.

C. Untreated base shall, in general, be seven (7) inches thick under parking stalls and travel areas and four (4) inches thick under walkways.

D. The subgrade on which base material is to be placed shall be compacted for a depth of at least six (6) inches to at least 95% of the maximum dry density as determined by AASHTO T-180 Method “D”. The subgrade shall be free of any loose material at the time that the asphalt paving is placed.
SECTION 2-1-7 BITUMINOUS PAVING

A. Section 02741 “Hot Mix Asphalt” of the State Specifications shall control.

B. The asphalt cement shall be AC-10 penetration grade unless changed by written order of the owner.

C. The combined dry mineral aggregate shall be uniformly graded and conform to the following gradation:

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>IDEAL GRADATION (% PASSING)</th>
<th>TOLERANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 inch</td>
<td>100</td>
<td>+10</td>
</tr>
<tr>
<td>No. 4</td>
<td>70</td>
<td>+10</td>
</tr>
<tr>
<td>No. 16</td>
<td>35</td>
<td>+7</td>
</tr>
<tr>
<td>No. 50</td>
<td>17</td>
<td>+6</td>
</tr>
<tr>
<td>No. 200</td>
<td>7</td>
<td>+2</td>
</tr>
</tbody>
</table>

D. A tack coat will be required on all existing pavements and concrete where they come into contact with new pavement. The tack coat material shall conform to the quality and be applied as specified in Section 02748 of the State Specifications. A prime coat will not be required on base material or subgrade.

E. The asphalt paving may be placed in lifts not to exceed three (3) inches in final thickness. However, in no instances can the lift thickness be greater than that which can be compacted to the required density with the compaction equipment being used. The thickness as shown in the bid items refers to final compacted thickness.

SECTION 2-1-8 TACK COAT

A. The contractor shall sweep, or otherwise clean, the existing pavement of all loose and foreign material. A tack coat shall then be applied in accordance with Section 02748 of the State Specifications, and shall be an emulsified asphalt type SS-1, SS-1h, CSS-1 or CSS-1h. The rate of application shall be 0.20 to 0.30 gal/sq.yd. unless otherwise specified.

B. Provide surface for pedestrian access across tack coat.

C. Prevent pedestrians, vehicles, pets, etc., access to tack surfaces.

D. Protect all surfaces from being spattered or marred. Remove any spattering, over-coating, or marring.

E. Do not permit traffic to travel over the tacked surface until bituminous tack coat has cured or is not picked up by traffic.
SECTION 2-1-9 SPECIAL FABRIC IMPREGNATED IN ASPHALT

A. GENERAL CLEAN UP
   1. Asphalt shall be swept with a mechanical broom.
   2. All loose material shall be picked up and hauled off.
   3. Pavement surface shall be dry, free of dirt, grease and loose material.

B. ASPHALT PATCHING
   1. Any alligatored asphalt and potholes shall be removed and replaced with seven (7) inches of gravel and two and one-half (2-1/2) inches of asphalt.

C. ASPHALT LEVELING COURSE
   1. An asphalt leveling course (when specified) shall be placed to fill in the low areas. When completed, the surface shall be within 1/2" of a constant grade across the surface.

D. BITUMINOUS TACK COAT
   1. An asphalt cement tack coat shall be used. ("Cut-back" asphalts shall not be used under any circumstances).
   2. The asphalt grade shall be AC-10.
   3. The quantity of tack coat shall be 0.25 gal/sq yd.
   4. The tack coat shall be sprayed uniformly in one pass at a spray width of approximately 8" greater than width of fabric. Excessive spill shall be removed.
   5. The temperature of tack coat shall be a minimum of 290 degrees Fahrenheit and not over 325 degrees Fahrenheit.

E. FABRIC
   1. The fabric shall be a polypropylene material, nonwoven and needlepunched.
   2. It shall be laid down in accordance with the manufacturer's specifications and instructions and in accordance with the following instructions:
      a. The fabric shall be laid smoothly in order that no wrinkles are present. Any wrinkles will be cut and tacked between layers.
      b. The fabric shall be overlapped both side-to-side and end-to-end, a maximum of 6" and a minimum of 3".
      c. All overlaps shall be tacked between overlaps.
F. WEATHER LIMITATION
   1. Tack coat or fabric shall not be laid when the existing pavement is wet or if the air temperature is less than 50 degrees Fahrenheit.

G. ASPHALT OVERLAY
   1. A minimum 1-1/2" (or otherwise specified) asphalt overlay shall be placed immediately following the fabric lay down and compacted to BYU specifications.

SECTION 2-1-10 CRACK SEALING

A. DESCRIPTION
   1. This work involved the placing of hot asphalt-rubber sealant in joints and cracks.

B. PREPARATION
   1. Prior to the application of hot asphalt-rubber sealant, joints and cracks shall be cleaned to remove dust, dirt, moisture and foreign material or old sealant.
   2. Cracks less than 3/8" in width will be routed to a width of at least 1/2".

C. ASPHALT-RUBBER SEALANT
   1. Crack Sealant:
      A. Homogeneous blend of asphalt cement, plasticizers and minimum of 25% (plus or minus 2%) or "crumb" rubber by weight, combined in such a manner as to produce material with following properties:
         a. Material shall pour readily and penetrate large cracks at room temperatures below 400°F.
         b. Softening Point (R and B) – 135°F. minimum.
         c. Flexibility - 1/8 inch thick specimen of product conditioned to 10°F. shall be capable of being bent to 90° angle over one inch mandrel without cracking.
         d. Curing - Product shall contain no water or volatile solvents and shall cure immediately upon cooling to sufficient viscosity to prevent tracking by traffic.

   2. The asphalt-rubber sealant shall be heated to the manufacturer's required temperature range.

D. APPLICATION
1. Joints and cracks shall be sealed from the bottom up. Sealant material shall be applied so that it is flush with the surface or slightly bulging.

2. The rubber and asphalt shall not separate when placed on the pavement.

3. The sealant shall not extend more than 2” nor less than 1” on either side of the crack.

4. Contractor shall be responsible for any sealer pulled out of the cracks.

5. Asphalt overlay shall not be placed within 72 hours of installation of crack sealer.

6. Traffic shall not be allowed on the material until it has cured or until it has been sanded to prevent tracking.

7. Sealant materials shall not be placed at air temperatures below 40° when moisture is present.

SECTION 2-1-11 ASPHALT PATCHING

A. This item of work consists of the removal of existing broken asphalt, paving and replacing it with new asphalt paving. The areas to be removed shall be designated by the owner and the material removed shall be the property of the contractor and removed from the campus. Payment shall be by the square foot.

B. The asphalt to be removed shall be saw cut completely through to give a smooth, vertical surface with no jagged edges. Payment for saw cutting will be by the linear foot.

C. The subgrade for the new paving shall be thoroughly compacted and brought to a uniform level at least two and one-half (2-1/2) inches below the adjacent pavement. Particular care shall be given that at least the full two and one-half (2-1/2) inch depth exist all along the perimeter of the patch.

D. If it is necessary to remove existing base material and subgrade material in order to stabilize the area for proper patch, the contractor shall remove this material and dispose of it as directed. The new subgrade shall then be trued and thoroughly compacted by wheel rolling. Base material shall then be placed, compacted and graded as in paragraph B of section 2-1-6.

E. Payment for additional base material thus required will be paid for by the cubic yard and will include the removal and disposal of the unsuitable material. Payment for patching will be by the square foot and will include removal of the broken asphalt paving and replacement with new asphalt paving, including the necessary tack coat and saw cutting.
SECTION 2-1-12 SAFETY

A. Suitable barricades, lights, signs, flashers and other safety devices for preventing injury or damage to traffic or individuals shall be furnished by the contractor. All of these devices shall be approved by the owner, but this approval shall not relieve the contractor from his responsibility for their adequacy or for conducting a completely safe operation.

SECTION 2-1-13 FINAL GRADING & CLEAN-UP

A. Any damage to adjacent facilities attributed to the contractor shall be repaired by the contractor; or, if in the opinion of the owner the damaged facility cannot be satisfactorily repaired, it shall be replaced by the contractor at no added expense to the owner.

B. Asphalt paving and other construction shall be blended to existing structures in a workmanlike manner.

C. All waste, unused materials, equipment and debris shall be removed by the contractor and the site left clean and attractive.

SECTION 2-1-13 WEATHER

A. Asphalt shall not be laid when the existing pavement is wet or if the air temperature is less than 50 degrees Fahrenheit unless approved by the engineer.
SECTION 2-2: CONCRETE PRODUCTS - SLABS ON GRADE

SECTION 2-2-1 GENERAL CONDITIONS

A. The Brigham Young University Standard Contract Requirements are hereby made a part of each section and are on file in the Construction Division, Department of Physical Plant. The requirements outlined therein are binding on the work of all trades as if specifically written into each section.

B. The State of Utah standard specifications for Road and Bridge Construction, 2005 Edition, shall apply to each and every phase of this project. No deviation will be allowed with the exception of those modifications listed herein.

SECTION 2-2-2 SCOPE OF WORK

A. Work included: This work consists of, but is not limited to, the furnishing of all labor, material and plant to perform all operations in connection with the replacement of all concrete removed on the project, and new concrete in strict accordance with these specifications.

B. Work not included: Removal and replacement of lawns, sprinklers and shrubs. (This work to be done by Physical Plant.)

C. Basis of Payment: Payments shall be by actual quantities installed and pricing determined by unit bid price as determined by the bid proposal.

D. Handicap Ramps: The area in the ramp that would be part of the curb and gutter shall be included in the standard curb and gutter pricing. The sidewalk portion of the handicap ramp shall be included in the standard sidewalk pricing.

SECTION 2-2-3 MATERIALS

A. Portland Cement: Section 03055 "Portland Cement Concrete" of the State Specifications shall control. Portland Cement Type II shall be used under this specification shall conform to the Standard Specifications for Portland Cement of the American Society for Testing Materials, Serial Designation C-150, as amended to date.

1. Geneva Rock or Staker/Parsons shall be the supplier of all concrete material.

B. Fibermesh type material will be required -- requirements are as follows:

1. Fibermesh type material shall be polypropylene or equivalent.

2. Fibermesh type material shall be mixed at a rate of 1.5 lbs/cu yd.
3. Fibermesh type material shall be mixed with the concrete until uniformly distributed throughout the concrete at the batch site.

C. Concrete Mix Requirements

1. The minimum average 28-day compressive strength of all stone concrete shall be 4,500 psi. There shall be a minimum of 6.5 bags of cement per cubic yard of concrete.

2. All concrete shall meet the requirements of Section 03055 - State of Utah Standard Specifications for Road and Bridge Construction - 2005 Edition, unless otherwise specified herein.

3. Air-entrained concrete shall be used throughout, using air-entrained Portland cement of a quality equal to "Utah" or "Ideal" brand cement. The air content shall be 6% (plus or minus 1%). The water used shall be clean and free from any substance that would adversely affect either the strength or the durability of the concrete.

4. Calcium Chloride shall not be added unless written consent has been given by the engineer or architect.

5. No additives shall be permitted unless approved by the engineer or architect.

6. The aggregate size and sieve mix used shall be determined by the thickness of the concrete and where it is to be placed, in accordance with ACI standards.

7. The water-cement ratio shall not be more than .45. The amount of water to be used may be reduced at the discretion of the owner's representative.

8. Slump: The maximum slump of all stone concrete as tested by the standard method of slump test, (ASTM C-143) shall be four (4) inches.

9. Transit Mix: Transit Mix concrete may be used if it meets the requirements for this section.

D. Concrete Proportions and Consistency: The proportions of aggregate to water and cement for all concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed on the work but without permitting the materials to segregate or excess free water to collect on the surface. The proportions shall be such that the required strengths will always be met.

E. Material tickets will be required for concrete, gravel, roadbase, etc. They will be delivered to the project coordinator within one weeks time of when delivery is made.
SECTION 2-2-4 CONSTRUCTION PROCEDURES

A. Mixing of Concrete: The concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged. If transit mix concrete is used, the concrete shall be mixed for a minimum of three (3) minutes at the jobsite before discharging.

B. Time of Hauling Ready Mixed Concrete: Concrete transported in a truck mixer or agitator shall be discharged at the job within the hour after the cement has been added to the water or the aggregates. The maximum volume of mixed concrete transported by truck shall be in accordance with the specified rating of the truck and in no case shall this volume be exceeded. The concrete must be maintained in a workable condition prior to discharge.

C. Placing: No concrete shall be placed except in clean, oiled forms of adequate strength which have been carefully set to both line and grade and which will not deflect or move under vigorous hand tamping or machine vibration of the fresh concrete. The base on which concrete is to be placed shall be thoroughly moistened immediately before depositing the mix. The concrete shall be compacted to the extent that no voids will remain in the finished concrete. Large aggregate shall be hand spaded or worked away from the forms or any exposed faces. If honeycomb or voids should appear in the finished concrete, it will be the option of the owner's representative to have such concrete repaired or removed at the contractor's expense.

D. Forms must conform to the dimensions shown on the plans without exception. Metal forms shall be used for straight sections. Curved sections shall not be formed with short straight sections unless the radius is at least 500 feet and special approval is given by the engineer. No concrete shall be shaped by hand to conform to curved lines. All forms shall be cleaned and oiled before depositing concrete to facilitate removal without damage to hardened concrete.

E. Finishing: Hand methods of striking off, screeding and consolidation will be permitted. All exposed surfaces shall be brought to an even uniform plane by wooden floats. Any process or method of finishing such as use of "Gandy" or steel trowling which causes segregation or brings fines, mortar, laitance or water to the surface shall not be allowed. The surface shall be brought to a smooth, even texture without exposing aggregate. All edges and joints shall be rounded to a radius of 1/2 inch and edger marks shall be removed. Contractor shall provide sufficient skilled finishers to properly finish each pour and limit the amount of concrete in each pour to that which can be properly finished by the workmen available. No "dusting" with cement to absorb water or wetting or sprinkling with water to facilitate finishing will be permitted. Unless otherwise specified, walks, curbs and gutters shall be finished by light brooming with a stiff bristle or wire broom.

F. Expansion joints in exterior walks and patios shall be spaced at 40'-0" or less. Control joints shall be spaced no more than 2.5 times in feet the thickness of the concrete in inches (30 times thickness of concrete). They shall have a depth of at least 1/4 the thickness of the concrete or no less than 1" deep.
1. See drawing for layout of joints (Page 2.E above) when at intersections of walks.

G. Curing: Provision shall be made for maintaining concrete in a moist condition for at least five (5) days after the placement of the concrete, except that for high early strength concretes, moist curing shall be provided for at least the first two days.

H. If asphalt will be removed, then saw cutting will be required. Payment shall be by the square footage of asphalt removed and linear foot for saw cutting.

I. Slabs and other flatwork: All flatwork or other horizontal surfaces shall be kept continuously moist by one or more of the following methods;

   a. Ponding;
   b. Two inches of sand kept continuously wet;
   c. Polyethylene sheets or water proof kraft paper held snug against the surface by weights and sand along the edges; or
   d. Sprayed-on curing compound: Hunts Teckkote Sealtex, Supercrete, Ashford Formula or A. C. Horn "Parting" Compound, clear for all outside slabs applied in strict accordance with manufacturer's instructions immediately after finishing. In the event that curing compound is chosen, all traffic shall be kept off the slab for the full period of curing.

J. Radii of intersecting sidewalks shall be as follows:

   Primary walks (10’ and larger width): 11’ radii
   Secondary walks (6-10’ width): 8’ radii
   Tertiary walks (4-6’ width): 5’ radii

   1. When two walks meet the length of the radius defaults to the lesser of the walkways.

SECTION 2-2-5 QUALITY CONTROL

A. General: The Owner will employ a testing agency to perform tests and to submit test reports.

B. Sampling and testing for quality control during concrete placement may include the following, as directed by Engineer.

   1. Sampling Fresh Concrete: ASTM 172, except modified for slump to comply with ASTM C 94.
a. Slump: ASTM C 143
b. Air Content: ASTM C 173 or ASTM C 231
c. Concrete Temperature: ASTM C 1064
d. Compression Test Specimen: ASTM C 31
e. Compressive-Strength Test: ASTM C 39

C. Test results will be reported in writing to the Engineer, ready-mix producer, and Contractor within 24 hours after tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests: Additional tests shall be performed by the owner as needed.

SECTION 2-2-6 SAFETY

A. Suitable barricades, lights, signs, flashers and/or other devices for preventing injury or damage to traffic or individuals shall be furnished by the contractor. All these devices shall not relieve the contractor for his responsibility for their adequacy or for conducting a completely safe operation.

SECTION 2-2-7 LAWNS AND SHRUBS

A. Removal and replacement of lawns, shrubs, topsoil and sprinkling lines will be by the owner. Contractor shall not damage areas outside his contract limit lines in the removal of earth or in the construction of facilities. He shall repair any such damage or reimburse the owner for costs involved in making the repairs.

SECTION 2-2-8 FINAL GRADING AND CLEAN-UP

A. All waste, unused materials, equipment and debris shall be removed and disposed of by the contractor. The site shall be left clean and attractive.
SECTION 2-3: EXCAVATION

SECTION 2-3-1 GENERAL CONDITIONS

A. The State of Utah Standard Specifications for Road and Bridge Construction shall apply to each and every phase of this project. No deviation will be allowed with the exception of those modifications listed herein.

SECTION 2-3-2 SCOPE OF WORK

A. Work included: This work consists of, but is not limited to, the furnishing of all labor, material and plant to perform all operations in connection with the installation of utility lines, roadways or any other condition in accordance with these specifications and the drawings.

B. Basis of Payment: Payments shall be by actual quantities installed and pricing determined by unit bid price as determined by the bid proposal.

SECTION 2-3-3 EXCAVATION

A. General: The excavation shall conform to the dimensions and elevations that may be necessary to carry out the true intent and meaning of the drawings.

1. This work shall include the excavation of material of every description found at the site which must be removed to complete the work.

2. In case the excavations are made too deep, the contractor shall fill in and compact same to the proper level.

3. Excavation shall be of such widths as may be required to properly and conveniently install the work and meet safety requirements.

SECTION 2-3-4 BACKFILLING AND COMPACTING

A. The contractor can use material excavated from the site unless material is undesirable for backfill. The owner will determine if material is undesirable or not. Undesirable asphalt and concrete shall be hauled off as part of installation costs. When undesirable excavation is discovered, it shall be hauled off at owner's expense. It shall be calculated on the cubic yard removed. Any fill material hauled in shall be paid for by the owner by the cubic yard with prior approval.

B. All fill material shall be compacted to a density of 95% as determined by the AASHTO T-180 Method "D" test unless otherwise specified by the owner.

C. The owner reserves the right to use any excess material which will not be required for filling and backfilling without any additional expense to the owner. If so indicated in writing, the contractor shall deposit this excess material within a 3-mile radius on the campus where directed.
D. Optimum moisture content shall be maintained at all times. If the material is too dry, then water shall be added until the optimum moisture content is reached. If the material is too wet, then it shall be mixed and blended with dry material until the optimum moisture content is reached.

E. All fill shall be placed in layers not to exceed 8" in depth and mechanically compacted to the required density.

F. When the natural ground material is not desirable for bedding around pipes, bedding material such as pea gravel or other fine granular material shall be placed under the pipe.

G. When the natural ground material is not desirable for bedding around pipes, bedding material such as pea gravel or other fine granular material shall be placed under the pipe within a depth of 4 inches and 6 inches on the sides and top.

SECTION 2-3-5 INSTALLATION OF UTILITY LINES

A. The bottom of the trench shall be shaped to give substantially uniform circumferential support to the lower fourth of each pipe. Pipe laying shall proceed upgrade with the spigot ends of bell and spigot pipe and the tongue ends of tongue and groove pipe pointing in the direction of the flow. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line. As the work progresses, the interior of the pipe shall be cleaned of all dirt and superfluous materials of every description. Where cleaning after laying is difficult because of small pipe size, a suitable swab or drag shall be kept in the pipe and pulled forward past each joint immediately after the jointing has been completed.

B. Trenches shall be kept free from water and debris and pipe shall not be laid when the condition of the trench or the weather is unsuitable for such work. At times when work is not in progress, open ends of pipe and fittings shall be securely closed to the satisfaction of the owner's representative so that no trench water, earth or other substance will enter the pipe or fittings.

C. Concrete Sumps:

1. Description: Work shall consist of sumps as indicated and conforming in all respects to the lines, grades and cross sections shown on the drawings. All concrete work shall be in accordance with the applicable specifications of Concrete, Section 2-2.

2. Provide covers and frames for surface sumps as called for on the drawings.

SECTION 2-3-6 CLEAN UP

A. The contractor shall at all times keep premises clean, removing all debris resulting from his operations.
B. Upon completion of the work herein before specified, the contractor shall rake up and remove from the site all rubbish, trash and debris resulting from the operations and shall leave the site in a neat, clean and acceptable condition.

SECTION 2-3-7 SPECIAL CONDITIONS

A. The contractor will be responsible for removal of all material excavated to provide for the concrete work, including forms. No material will be left on site for others to haul off such as wood forms, stakes, sod, dirt, excess concrete, or other materials. Contractor shall clean up areas of work at end of each day and protect site with wooden barricades so that site is always protected from any safety hazards.

B. Site shall be protected against pedestrians passing through the construction area until project is completed.

C. Equipment left unattended shall be left in such a way that no hazard will exist.

D. Access to sites shall be discussed with Grounds Department and Project Coordinator in advance of commencing project to determine best route and minimize damage to grounds and sidewalks. Contractor will be responsible for placing plywood or other means to protect the adjacent landscaping. Damage to adjacent landscaping will be deducted from the contract. Oil drippings from equipment will be cleaned up by the contractor. Any damage done to existing facilities beyond reasonable access shall be paid for by the Contractor.

E. Contractor shall provide a schedule of his next projects at the beginning of each week and will follow that schedule as close as possible. Tear-out of concrete shall not be permitted longer than two weeks before new concrete is placed.

F. Project Coordinator shall communicate with users of area in advance of any construction to inform them of timing and completion of project
SECTION 2-4 FENCING PROJECTS

Section 2-4-1 General Conditions

A. This specification covers the material, fabrication, delivery and erection of galvanized steel, diamond mesh, chain link fencing, COMPLETE WITH GATES AND ALL OTHER ACCESSORIES.

Section 2-4-2 Scope of Work

A. The contractor shall supply and install all fence work in accordance with design drawings and this specification. Fence height, layout, style, and the lines and grades shall be as shown on the drawings.

Section 2-4-3 Material

A. Fabric: The chain link fabric shall be woven of #9 gage steel wire and have a uniform diamond mesh approximately 2 inches between the parallel sides and shall be aluminum coated or hot-dipped galvanized after weaving. The wire in the completed fabric shall have an ultimate tensile strength of 80,000 psi based on the cross-sectional area of the galvanized wire.

B. Posts: All posts shall conform to ASTM A-120 schedule 40, steel pipe, or ASTM A-123 for structural members. All pipe post tops shall be designed to exclude moisture from the post interior. Minimum nominal post diameter shall be as follows:


C. Top and Brace Rail and Tension Bars: Top and brace rail shall be 1.625 inch O.D. schedule 40 pipe - 2.27 lb. or 1 5/8" x 1 1/3" roll from section of equal bending strength. Expansion sleeves shall be furnished to allow for expansion and contraction of top rail. Tension bars shall be 1/4" x 3/4" galvanized steel bars.

D. Truss Pod and Turnbuckle: Truss rods shall be 3/8" diameter steel rod. Turnbuckles shall be cast steel.

E. Gates: Gates shall match the style of the fence and shall be fabricated from 1.90" O.D. schedule 40 pipe. Frames shall be of welded construction.

F. Hardware: Contractor's standard hardware with the following clarifications:

1. Hinges: Double clamping offset type, 180 swing, malleable iron castings.
2. Latches: Single swing gates less than 10' opening shall have a fork latch. Single swing gates 10' and wider shall have a latch of the plunger bar type. Double gates shall have eccentric double locking type latches which engage strikes securely bolted to the gate frames at both top and bottom, and also a heavy malleable iron non-freezing gate stop anchored in a concrete footing at the center of all double gate openings. Latches shall be readily locked with a padlock, but locks shall not be furnished.
3. Keepers: Automatic "hold-open" type, installed at bottom rails shall be furnished with all swing gates.

G. Miscellaneous

1. Bottom tension wire shall be No. 7 gate coil spring steel wire.

2. Wire tires shall be No. 11 gage steel wire clips or No. 9 gage aluminum.

3. Hog rings, for attaching tension wire to fabric shall be No. 12 gage, steel wire.

H. All wire material shall be galvanized, or aluminum coated steel.


Section 2-4-4 Installation and Erection

A. Unless otherwise noted, the fence shall follow the ground line with not more than two inches clearance below bottom of fence. Any appreciable difference in elevations shall be noted on the drawings. All above ground obstructions which would interfere with the fence erection will be removed by the Owner prior to erection of the fence.

B. Line posts shall be installed at not more than 10 feet center to center, plumb both ways. Posts shall be "stepped", as indicated, when necessitated by grade variances.

C. All terminal posts shall be rigidly braced so that vertical position is maintained under stress of stretched fabric; corner posts braced both ways. Sliding gates shall be equipped with pipe extensions for trolley supports from overhead tracks. Gates shall be fully welded and supported without sag in any direction.

D. All posts shall be set in concrete. Concrete for post holes shall be in the proportions of 1, 3, 4 mix using the best Portland cement, clean sharp sand, and gravel or broken stone. All post holes shall be a larger diameter at the base than at grade level with four (4) inches of concrete below bottom of post.

1. Line post holes shall be minimum of 36 inches deep below finished grade with a minimum diameter of 10 inches at the top. Terminal, corner, or pull post holes shall be 40 inches deep below finished grade with a minimum diameter of 12 inches at the top. Line posts shall be set full 32 inches into the hole and all others 36 inches deep. The top exposed surface of the concrete footing shall be sloped to provide a neat appearance to shed water.

2. Gate post holes shall be a minimum of 40 inches deep below finished grade. Holes for 4 inch diameter at grade. Holes for gate posts larger than 4 inch diameter shall be a minimum of 16 inch diameter at grade.

E. Brace rails shall be provided at all end posts and on both sides of any corner or pull post. Brace rails shall extend from the end, corner, or pull post to the first adjacent post and shall be securely fastened at both ends. Brace rails shall be located at a point two thirds the height of the fence fabric when top rails
are not provided. When top rails are provided, brace rails shall be located midway between the top rails and the grade line.

F. Truss Rods: A diagonal truss rod shall be provided at brace rail locations and shall be securely mounted extending from the line post end of the brace rail to a turnbuckle lined by a brace band or hook bolt to the base of the terminal or pull post.

G. Fabric: Fabric shall be fastened to gate frames with hook bolts or bands and tension bars. Fabric shall be fastened to terminal posts using tension bars inserted and held in place by tension bands placed at maximum intervals of 16 inch in the vertical. Fabric shall be installed 2 inches above ground level and securely fastened with tire ties spaced not more than 14 inches apart on top and brace rails. When joining rolls of fabric, they shall be properly tensioned by double block pullers and the ends matched and joined by a spiral connecting link. All fabric shall be stretched tightly to ensure overall good appearance and soundness of fencing with no distortion, no sag, no warping, and no unevenness.

H. Tension Wire: Tension wires shall be attached to the top (except when top rail is specified) and to the bottom of the fabric by means of hog ring fasteners spaced at 24 inch intervals and to the terminal post by means of brace bands.

Miscellaneous Site Work

Hose Bibs

A. Hose bibs shall be installed around the perimeter of the building about every one hundred feet for washing of windows, watering planters, etc. The following brands and numbers are recommended:

- Zurn #Z-1300
- Jay R. Smith #117
- Jasam 71000

Lawn Sprinklers

A. The contractor will provide a 120 volt dedicated hardwired (so it can’t be unplugged) circuit for the controller. A location needs to be specified (in a boiler room, etc). Provide a 2” conduit for the control wires to an outside planting area. Provide a 1 ½ inch conduit to the building communications system so the controller can be controlled remotely. Contact the BYU Grounds Department (422-5510) for details. Sprinkler controllers will be provided and installed by Owner.

B. All sprinkler system planning and installation will be done by the Owner.

C. Tees for sprinkler systems shall be 3” plug type.

Landscaping

A. Landscaping including topsoil, sod, shrubs, groundcover, pavers, landscape boulders, trees, etc. and sprinkler systems will be provided and installed by the BYU Grounds Department. The contractor will be responsible to provide rough grading to within approximately 8 inches for sod and 18 inches for shrubs of all finished grades.
Stair Tread Nosing (Exterior Concrete Stairs)

A. Specify Wooster Products, Inc., Supergrit stair tread type 231 BF (See detail, p. 2.D above) or American Safety Tread in extruded aluminum 6063-T6m Helana, Alabama 35080. Type number 3511. Color is to be black with 3” minimum width.