



State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Department of Administrative Services

KIMBERLY K. HOOD
Executive Director

Division of Facilities Construction and Management

DAVID G. BUXTON
Director

ADDENDUM NO. 1

Date: August 11, 2008

To: Contractors

From: Wayne Smith, Project Manager, DFCM

Reference: JLTC Parking Lot Improvements – Phase 1
Camp Williams – Utah National Guard
DFCM Project No. 07011480

Subject: **Addendum No. 1**

Pages	Addendum Cover Sheet	1 page
	Revised Bid Form	2 pages
	Engineer's Clarifications, Table of Contents, Drawings, Specifications, and Summary of Work	30 pages
	<hr/> Total	<hr/> 33 pages

Note: *This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.*

While we contend that SB220 should only be potentially applicable to a contract issued after the effective date of said bill, this is to clarify that for purposes of this contract, regardless of the execution or effective dates of this contract, the status of Utah Law and remedies available to the State of Utah and DFCM, as it relates to any matter referred to or affected by said SB220, shall be the Utah law in effect at the time of the issuance of this Addendum.

1.1 **SCHEDULE CHANGES:** No Project Schedule changes.

1.2 **GENERAL ITEMS:**

1.2.2 Revised Bid Form – two unit prices added. See attached.



**BID FORM – REVISED
PER ADDENDUM NO. 1 DATED AUGUST 11, 2008**

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Invitation to Bid" and in accordance with the Request for Bids for the **JLTC PARKING LOT IMPROVEMENTS – PHASE I – CAMP WILLIAMS – UTAH NATIONAL GUARD – RIVERTON, UTAH - DFCM PROJECT NO. 07011480** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

BASE BID: For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS (\$ _____)
(In case of discrepancy, written amount shall govern)

UNIT PRICE NO. 1:

Price per square foot for asphalt and striping for one half of the parking lot. \$ _____/Sq. Ft.

UNIT PRICE NO. 2:

Price per square foot for asphalt and striping for the entire parking lot. \$ _____/Sq. Ft.

I/We guarantee that the Work will be Substantially Complete by **November 19, 2008**, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **\$250.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____

BID FORM
PAGE NO. 2

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract. The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable 100% Performance and Payment bonds are not delivered within time set forth.

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

Respectfully submitted,

Name of Bidder

ADDRESS:

Authorized Signature

ADDENDUM NO. 1



Stantec

BID DOCUMENTS FOR
JLTC PARKING LOT IMPROVEMENTS - PHASE 1
ISSUED BY:

August 11, 2008
FILE: 07011480
Thomas McKenna
STANTEC CONSULTING INC.
Tel: (801) 261-0090
Fax: (801) 266-1671
thomas.mckenna@stantec.com

This Addendum is to be issued to bidders and forms a part of the Contract Documents and modifies the original Bidding Documents.

1. Clarifications

- 1.1. The Base Bid has been revised to include all concrete work, storm drain pipe, and catch basin in the parking area.
- 1.2. When bid documents are submitted to DFCM a signed copy of the price for asphalt that day from the batch plant is required. When the asphalt is to be placed another signed copy of the price for asphalt that day is required. A change order will be issued if there is a difference between the two.

2. Specifications

- 2.1. The table of contents has been revised
- 2.2. The contents of the Additive Alternate 1 in Section 01110 'Summary of Work' has been revised
- 2.3. The following sections have been added:
 - 2.3.1. 02520 Concrete Driveway, Walk, Curb and Gutter
 - 2.3.2. 02720 Storm Drain Systems

3. Drawings

- 3.1. Sheet GI-001 has been revised
- 3.2. Sheet CS-101 has been revised
- 3.3. Sheet CS-102 has been added

4. Attachments

- 4.1. Specifications Table of Contents
- 4.2. Section 01110
- 4.3. Section 02520
- 4.4. Section 02720
- 4.5. Sheet GI-001
- 4.6. Sheet CS-101
- 4.7. Sheet CS-102

Distribution:

Each Bidder
Project File
Camp Williams
DFCM

Revised: 2006-06-01

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DIVISION 1 GENERAL REQUIREMENTS

<u>SECTION</u>	<u>TITLE</u>
01110	SUMMARY OF WORK
01111	SITE CONDITIONS
01400	QUALITY CONTROL

DIVISION 2 SITE WORK

<u>SECTION</u>	<u>TITLE</u>
02200	EARTHWORK
02222	EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES
02230	SITE CLEARING
02513	ASPHALTIC CONCRETE PAVING
02520	CONCRETE DRIVEWAY, WALK, CURB AND GUTTER
02570	STORM DRAIN SYSTEMS
02810	IRRIGATION

DIVISION 16 ELECTRICAL

<u>SECTION</u>	<u>TITLE</u>
16001	ELECTRICAL GENERAL PROVISIONS
16110	CONDUIT RACEWAYS

SECTION 02520

CONCRETE DRIVEWAY, WALK, CURB AND GUTTER

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Subgrade preparation for walkways, driveways, ramps, curbs and gutters, waterways.
- B. Base course for walkways, driveways, ramps, curbs and gutters, waterways.
- C. Concrete walkways, driveways, ramps, curbs and gutters, waterways and other concrete flat work, complete with reinforcement as required.

1.02 RELATED WORK

- A. Section 02200: Earthwork

1.03 REFERENCE STANDARDS

- A. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- B. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- C. ASTM C33 - Concrete Aggregates.
- D. ASTM C94 - Ready-Mixed Concrete.
- E. ASTM C150 - Portland Cement.
- F. ASTM C260 - Air-Entraining Admixtures for Concrete.
- G. ASTM C309 - Liquid Membrane - Forming Compounds for Curing Concrete.
- H. ASTM C1116 - Fiber Reinforcement.
- I. ASTM D1557 - Tests for Moisture - Density Relations of Soils using 10 lb (4.5 kg) Rammer and 18 inch (457 mm) Drop.
- J. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 INSPECTION AND TESTING

- A. Three (3) concrete test cylinders will be taken for every 100 cu. yds. of concrete

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placed.

- B. One (1) additional test cylinder will be taken during cold weather concreting, and be cured on job site under same conditions as concrete it represents.
- C. One (1) slump test will be taken for each set of test cylinders taken.

PART 2 - PRODUCTS

2.01 UNTREATED BASE COURSE MATERIAL

- A. Angular crushed natural stone; free from shale, clay and friable materials and debris; graded within following limits per ASTM C 136:

GRADATION, 1" MAXIMUM SIZE

<u>Sieve Size</u>	<u>% Passing</u>
1 inch (25 mm)	100
¾ inch (19 mm)	90 to 100
½ inch	78 to 90
3/8 inch	65 to 70
No. 4	47 to 61
No. 16	23 to 35
No. 50	10 to 20
No. 200	5 to 11

- B. Material passing the No. 40 sieve: Non-plastic and liquid limit less than twenty-five (25), when tested in accordance with AASHTO Test Methods T-89 and T-90.
- C. Percentage of wear not to exceed fifty (50) when tested in accordance with AASHTO Test Method T-96.
- D. Rodded Weight: Not less than 75 pounds per cubic foot when tested in accordance with AASHTO Test Method T-19.
- E. California Bearing Ratio Value (CBR) of eighty (80) minimum when tested in accordance with ASTM Test Method D-1883.
- F. Determine material passing the No. 200 sieve by washing in water in accordance with ASTM Test Method T-11.

2.02 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150; Type II
- B. Fine Aggregate for Concrete.

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1. Fine aggregate deleterious substance limits conform to the requirements of ASTM C 33 with the following exceptions:

<u>Substance</u>	<u>Max. % by Weight</u>
Clay Lumps	0.5
Coal and Lignite	0.3
Other Substances	2.0

2. Grading. Well-graded fine aggregate from coarse to fine conforming the following gradation requirements:

<u>Sieve Size</u>	<u>% Passing</u>
3/8 inch	100
No. 4	90 to 100
No. 50	10 to 30
No. 100	2 to 10

C. Coarse Aggregates for Concrete.

1. Crushed stone, gravel, or other approved inert materials of similar characteristics, or combinations thereof, having strong and durable pieces.
2. The aggregates shall be free from vegetable matter, lumps or balls of clay, adherent films of clay, or other matter that would prevent thorough bonding. Coarse aggregate deleterious substance limits conform to the requirements of ASTM C 33 with the following exceptions:

<u>Substance</u>	<u>Max. % by Weight</u>
Coal and Lignite	0.3
Clay Lumps	0.3
Soft Fragments	2.0
Other deleterious substances (such as friable, thin, elongated, or laminated pieces)	2.0

3. Wear and Soundness. ASTM C88. Percentage of wear for coarse aggregates of not more than 40 when tested in accordance with AASHTO T-96 or show a sodium sulphate loss not to exceed 12 percent (12%) when tested in accordance with AASHTO T-104. The wear and soundness requirements may be waived, or modified, by the Engineer provided that the coarse aggregate has a proven service record for similar service and exposure.
4. Gradation. Per ASTM C33. Coarse aggregate for concrete shall meet the following gradation limits for the concrete class specified. Other sizes or combinations of sizes may be used when specified.

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<u>Sieve Designation</u>	<u>Percent Passing (by weight)</u>
1 "	100
3/4"	95-100
1/2"	-
3/8"	20-55
No. 4	*0-10

*Not more than five percent (5%) shall pass a No. 8 sieve.

- D. Water: Clean and free from injurious amounts of oil, alkali, organic matter, or other deleterious material, complying with AASHTO T-26.
- E. Air-Entraining Agent: Use in all weather-exposed concrete. Comply with ASTM C260, except the dilative durability factor in the freezing and thawing test shall not be less than 95.
- F. Fiber Reinforcement (include when specifically indicated): Synthetic fibers engineered and designed for secondary reinforcement of concrete slabs, complying with ASTM C116, Type III.

2.03 CONCRETE MIX

- A. Mix and proportion to produce minimum 4000 psi compressive strength concrete at 28 days with maximum slump of 3 inches and 5 to 7 percent air-entrainment.
- B. Provide Ready-Mixed concrete. Comply with ASTM C 94.
- C. Use accelerating admixtures in cold weather only when acceptable to Engineer. Use of admixtures shall not relax cold weather placement requirements. Do not use calcium chloride.
- D. Use set-retarding admixtures during hot weather only when acceptable to Engineer.

2.04 REINFORCING MATERIALS

- A. Reinforcing Bars: 60 ksi yield strength; plain deformed billet steel bars; ASTM A615; plain finish.
- B. Epoxy-Coated Reinforcing Bars (use where indicated): ASTM A775 with ASTM A 615, Grade 60 deformed billet steel bars.
- C. Welded Steel Wire Fabric: Plain type, ASTM A185; plain finish.
- D. Tie Wire: Minimum 16 gage annealed type, or patented system acceptable to Engineer.

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- E. Joint Dowel Bars: Plain steel bars, ASTM A615, Grade 60 plain steel bars.
- F. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting and fastening reinforcing bars, welded wire fabric and dowels in place. Use wire bar-type complying with CRSI specifications.

2.05 FORMS

- A. Plywood, metal, metal-framed plywood or other acceptable panel type materials to provide full-depth, continuous, straight, smooth exposed surfaces. Use flexible or curved forms for curves of a 100-foot or less radius. Provide forms with matched, tight-fitting joints and adequate stiffeners to support weight of concrete without deflection detrimental to tolerances and appearance of concrete.
- B. Slip form construction may be used subject to approval of the Engineer. Provide slip-forming equipment with traveling side forms of sufficient dimensions, shape, and strength to support concrete laterally for a sufficient period of time during placement to produce pavement of the required cross-section. The equipment shall spread, consolidate, screed, and float finish the freshly placed concrete in such a manner as to provide a dense homogeneous pavement.
- C. Form Release Agent: Provide commercial formulation form-release agent that will not stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Comply with VOC limitation regulations.

2.06 JOINT MATERIAL

- A. Provide joint material of type, thickness, and widths indicated on the drawings.
- B. Joint Filler: Bituminous mastic complying with ASTM D 994, formed and encased between 2 layers of bituminous saturated felt or 2 layers of glass-fiber felt. Minimum ½ inch thick.
- C. Joint Sealant: Provide one of the following:
 - 1. Concrete Joint Sealer, Cold-Applied: Elastomeric type complying with ASTM C 920, Type S or M, Grade P or NS, Class 25, Use T, NT, M and O, chemically curing suitable for vehicular or pedestrian use, types of construction and substrates indicated, as recommended by Manufacturer.
 - a. Self-leveling
 - b. Shore Hardness: 40 plus or minus, 5 ASTM D 2240.
 - c. Final cure: 4 days maximum.
 - d. Service range: -10 to 150 degrees F.
 - 2. Concrete Joint Sealer, Hot-Applied: Resilient and adhesive compound type complying with ASTM D 340, Type and Grade suitable for specific application

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as recommended by Manufacturer.

- D. Obtain joint sealing materials from a single manufacturer for each different product required.
- E. Provide materials that are compatible with one another and with joint substrates under the conditions of service and application.

2.07 CURING MATERIALS

- A. Insulating Coverings: One of the following.
 - 1. Straw.
 - 2. Insulating blankets.
- B. Moisture-Retaining cover: One of the following, complying with ASTM C 171.
 - 1. Waterproof paper.
 - 2. Polyethylene film.
 - 3. White burlap-polyethylene sheet.
- C. Curing Compound: White-pigmented waterborne membrane-forming curing compound free from permanent color, complying with ASTM C 309, Type I, Class B.
- D. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

2.08 PAINTED TRAFFIC LINES AND MARKINGS

- A. Alkyd-resin ready-mixed paint, complying with AASHTO M 248, Type F. Provide approved substitute as required to comply with applicable VOC limitations.
- B. Color.
 - 1. Pavement and Parking Striping, Stop Bars - White.
 - 2. Crosswalks and Zebra Striping - White.
 - 3. Fire Lane Curbs - Red.
 - 4. Accessible Parking Markings - Blue.
- C. Non-slip Aggregate Finish (where indicated): Fused aluminum oxide granules or crushed emery as the abrasive aggregate for a non-slip finish, with aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent

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ferric oxide. Use material that is factory graded, packaged, rustproof, non-glazing, and unaffected by freezing, moisture and cleaning materials.

- D. Bonding Agent: Acrylic or styrene butadiene
- E. Epoxy Adhesive: ASTM C881, two-component material suitable for damp or dry surfaces. Material type, grade and class to suit requirements.
- F. Apply pavement markings only with equipment manufactured specifically for that purpose. Use equipment capable of applying a stripe of the desired width with a tolerance of plus or minus 1/4 inch.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Check construction staking. Notify Engineer of conflicts or slope and drainage deficiencies. Failure to check and verify or notify Engineer will result in Contractor repairing and drainage deficiencies at no additional cost to the Owner.
- B. Check form work with construction staking and drawing elevations prior to placing concrete. Adjust form work as necessary. Notify Engineer of conflicts or slope and drainage deficiencies.

3.02 PREPARATION OF SUBGRADE

- A. Ensure rough grading has brought subgrade to required elevations.
- B. Fill soft spots and hollows with additional structural fill.
- C. Level and compact subgrade, to receive granular base course for concrete walkways, ramps, curbs and gutters, to 95% of maximum laboratory density, AASHTO T-99, Method D.

3.03 PLACEMENT OF BASE COURSE

- A. Place and level untreated base course over prepared subgrade to a compacted depth indicated on drawings true to lines and levels. Compact to 95% of maximum modified proctor density, ASTM D 1557.
- B. Adjust moisture content of base course material, as determined by ASTM D 698, as necessary to plus or minus 2 percent of optimum moisture as required to obtain the specified degree of compaction.
- C. Protect placed and compacted base course. Remove and replace "softened" base course areas occurring between base course placement and concrete placement.

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- D. During concrete placement, keep base sufficiently moist to prevent excessive absorption of water from freshly placed concrete.

3.04 FORM WORK

- A. Provide sufficient forms to allow continuous progress of the work and so the forms can remain in place at least 24 hours after concrete placement.
- B. Make forms sufficiently tight to prevent loss of concrete.
- C. Form vertical surfaces to full depth and securely position to required lines, dimensions, and levels. Ensure form ties are not placed so as to pass through concrete.
- D. Arrange and assemble form work to permit easy dismantling and stripping, and to prevent damage to concrete during form work removal.
- E. At construction joints, overlap forms over hardened concrete at least 6 inches. Prevent offsets or loss of concrete at construction joint. Maintain a true surface.
- F. Position expansion joint material and other embedded items accurately and support to prevent displacement.
- G. Provide formed openings for elements embedded in or passing through concrete.
- H. Apply form release agent on form work per manufacturer's instructions. Apply prior to placing reinforcing steel, anchoring devices, and embedded items.
- I. Do not pry against face or visible edges of concrete to remove forms. Remove and replace sections of concrete work damaged during form removal at no additional cost to the Owner.
- J. Thoroughly clean and properly coat forms before reuse.

3.05 REINFORCEMENT PLACEMENT

- A. Reinforce concrete walks, curbs and gutters as required on the drawings.
- B. Clean reinforcement of loose rust, mill scale, earth, ice, or other bond-reducing materials.
- C. Comply with Concrete Reinforcing Steel Institute's recommended practice for placing and supporting reinforcing bars.
- D. Maintain minimum cover over reinforcement. Allow for a minimum 1-1/2 inch concrete cover unless otherwise noted.

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- E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps to prevent continuous laps.
- F. Do not extend reinforcing through expansion and contraction joints. Provide doweled joints through expansion and contraction joints, with one end of dowels fitted with capping sleeve to allow free movement.

3.06 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded.
- B. Remove snow, ice or frost from base course surface and reinforcing before placing concrete. Don not place concrete on surfaces that are frozen.
- C. Moisten base course if required to provide uniform dampened condition at the time of concrete placement.
- D. Coordinate with the testing laboratory prior to delivery of concrete. Schedule to have a testing agent on site prior to the start of the pour.
- E. Do not discharge concrete into forms if the slump or air-entrainment does not meet the specification requirements.
- F. Do not discharge concrete if the time period from the batching at the plant to site discharge exceeds the following:
 - 1. Air temperature less than 90 degrees F.: 1-1/2 hours
 - 2. Air temperature over 90 degrees F. (without a retarder): 1 hour
 - 3. Air temperature over 90 degrees F. (with a retarder): 1-1/2 hours
- G. When concrete arrives at the site with a slump below specified, water may be added if the maximum approved water/cement ratio and maximum slump is not exceeded provided that:
 - 1. Approved mix design allows for on-site addition of water.
 - 2. Water addition can be accurately measured to within a gallon of the desired quantity.
 - 3. Water addition is followed by 3 minutes of mixing at mixing speed prior to discharge.

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- H. Place concrete per ACI 301.
 - 1. Hot Weather Placement: Place per ACI 305.
 - 2. Cold Weather Placement: Place per ACI 306.1. Non-chloride accelerating admixture may be used in concrete work placed at temperatures below 50 degrees F.
- I. Maintain mixed concrete temperature at time of placement between 60 degrees F. and 90 degrees F.
- J. Do not disturb reinforcement, inserts, embedded parts and formed joints.
- K. Do not break or interrupt successive pours such that cold joints occur at locations other than expansion type joints.
- L. Honeycomb or embedded debris in concrete is not acceptable.
- M. Consolidate per ACI 309.
- N. Placement of curb and gutter by slip-form paving equipment is acceptable. Comply with the following:
 - 1. Provide adequate control for lines, grades and elevations.
 - 2. Provide equipment that will produce required cross-section, lines, grades, finish and jointing as specified for formed concrete.
 - 3. Prevent damage to adjacent curbs, gutters and pavement by equipment.
 - 4. After placement, check fresh concrete with a straight-edge to ensure the concrete complies with tolerances specified.
 - 5. Provide final finish on slip-formed curb and gutter in accordance with Section 3.07.
 - 6. If results are not acceptable, remove and replace work with formed concrete.

3.07 CONTRACTION JOINTS

- A. Construct at right angles to top surface of placement.
- B. Construct straight unless otherwise indicated.
- C. Construct traverse and longitudinal joints the same dimension.
- D. Tooled Joints (Score Lines): Maximum depth 1 inch with a top radius of ½ inch, unless otherwise noted on the drawings.

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- E. Saw Cut Joints: Saw cuts before uncontrolled shrinkage cracking occurs. Do not tear or ravel concrete during sawing.
- F. Templates: 1/8 to 3/16 inch wide.
- G. Sidewalks: Construct contraction joints as follows.
 - 1. At intervals equal to the width of the sidewalk and transverse to the line of the walk.
 - 2. Radial at curbs and walks.
 - 3. Place longitudinal joints in walks with width of walk in feet is greater than 2 times the walk thickness in inches (e.g. Maximum width of a 4 inch thick walk before placement of a longitudinal joint is 8 feet).
 - 4. At walk returns make joints radial.
 - 5. Match longitudinal and traverse joints with adjacent walks.
- H. Curb, Gutter, Waterway: Construction joints as follows:
 - 1. Place joints at intervals not exceeding 10 feet.
 - 2. At curb radius and walk returns make joints radial.
 - 3. Where possible, make joints of curbs coincide with joints in walks.
 - 4. Where integral curb and gutter is adjacent to concrete pavement, align joints with pavement joints where practical.

3.08 EXPANSION JOINTS

- A. Place expansion joints where indicated on the drawings and at immovable structures, when sidewalks abut curb, at points of curve, and at back of curb returns.
- B. Construct at right angles to top surface of placement.
- C. Construct straight unless otherwise indicated.
- D. Construct traverse and longitudinal joints the same dimension.
- E. Place expansion joint material to full depth and width of joint. Fit joints with filler of required profiles, set perpendicular to longitudinal axis of walks, ramps, curbs and gutters.

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- F. Do not place longitudinal expansion joints in waterways
- F. Do not place expansion joints in curb returns.
- G. Do not extend reinforcement through an expansion joint. Place dowel mechanisms as required.

3.09 SEALED JOINTS

- A. Provide sealed joints where required on the drawings. Install cold or hot-applied sealant as required.
- B. Saw cut joints as necessary to provide the required sealant thickness and depth.
- C. Remove oil, grease, wax, form-release agents, curing compounds and other materials by sand or water blasting as recommended by the manufacturer of the sealant. Remove frost and moisture prior to sealing.
- D. Install sealants in uniform, continuous ribbons without gaps or air pockets with complete bonding of joint surfaces.
- E. Fill surface rabbet flush with pavement surface.
- F. Fill joints to a depth equal to 75 percent of the joint width, but not less than 3/8 inch deep or greater than 5/8 inch deep, unless otherwise indicated on the drawings.
- G. Do not overfill joints. Clean overflow or spillage from adjoining surfaces.

3.10 FINISHING

- A. Round all edges, including edges of expansion and contraction joints, with 1/2 radius edging tool, unless otherwise noted on the plans. Eliminate tool marks on concrete surfaces.
- B. Ensure finished surfaces do not vary from true lines, levels or grade by more than 1/8 inch in 10 feet (3 mm in 3 m) when measured with straightedge.
- C. Screed and float exposed surfaces to a smooth and uniform finish, free of open texturing and exposed aggregate. Avoid working mortar to surface. Remove and replace sections where the surface has been overworked at could result in spalling.
- D. Finish exposed surfaces of walks with grades of less than or equal to 6 percent with a fine-hair broom applied transverse to the line of the walk.
- E. Finish exposed surfaces of walks with grades of greater than 6 percent with a rough broom applied transverse to the centerline.
- F. Finish exposed surfaces of curbs, gutters and waterways with a medium texture

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broom applied longitudinal to the line of the curb, gutter or waterway.

- G. Provide detectable warnings in the concrete surface at curb ramps
- H. Do not add water to concrete surface (sprinkle) without approval of the Engineer.

3.11 CURING

- A. Apply curing compound on finished surfaces immediately after placement. Apply in accordance with manufacturer's recommendations.
- B. Do not apply curing compound to areas to receive special finishes or paint.
- C. Protect placed concrete from freezing or excessive moisture loss. Install covers or apply compounds as required. Apply compounds in accordance with manufacturer's recommendations.

3.12 PAINTING

- A. Apply traffic paint for curbs and markings at all fire lanes and other locations as indicated on the drawings.
- B. Apply with mechanical equipment to produce uniform straight edges.
- C. Apply at manufacturer's recommended rates to provide a 15-mil minimum wet film thickness.

3.13 FIELD QUALITY CONTROL

- A. Line: Less than ½ inch variance in 10 feet and not more than 1 inch from true line at any location.
- B. Grade: Not more than 1/4 inch variance in 10 feet. Flood curb and gutter with water after final cure has been reached. Remove and replace any area where ponding is found to stand more than 3/8 inch deep.
- C. Walk Cross Slope: Slope indicated on plans or 4 percent maximum, 1 percent minimum.

3.14 PROTECTION

- A. Prevent damage to placed concrete.
- B. Exclude traffic or equipment from placed concrete for a minimum of 14 days.
- C. Maintain a clean surface and remove spill and surface stains until Substantial Completion.

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- D. Remove and replace damaged areas, discolored areas, or cracked sections at no additional cost to the Owner.
- E. Do not backfill against placed concrete for a minimum of 7 days, unless otherwise approved by the Engineer.
- F. Do not permit paving operations (base course or asphalt) against placed curbs, gutters and waterways for a minimum of 7 days, unless otherwise approved by the Engineer.
- G. Do not permit paving operations against placed curbs and gutters without completed backfilling behind curbs.

END OF SECTION 02520

SECTION 02720

STORM DRAIN SYSTEMS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Install storm drainage pipe, catch basins, manholes, and other appurtenances.
- B. Install roof drain lines and cleanouts to a point five (5) feet outside buildings and structures.
- C. Adjust catch basins and other appurtenances to finish grade.
- D. Flush and clean all storm drainage lines.

1.02 RELATED WORK

Section 02222, Excavating, Backfilling, and Compacting for Utilities.

1.03 QUALITY ASSURANCE

All products are subject, at the discretion of the Construction Manager, to inspection and approval at the plant of the manufacturer. Any material not meeting the requirements specified herein shall be rejected and shall be removed immediately from the vicinity of other material furnished for the project.

1.04 REFERENCES

- A. ASTM A48 Gray-Iron Castings
- B. ASTM C76 Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
- C. ASTM C150 Specification for Portland Cement
- D. ASTM C443 Joints for Concrete Sewer and Culvert Pipe, Using Rubber Gasket
- E. ASTM C478 Pre-cast Reinforced Concrete Manhole Sections
- F. ASTM D2321 Standard Recommended Practice for underground Installation of Flexible Thermoplastic Sewer Pipe
- G. ASTM D3034 Type PSM Polyvinyl Chloride Sewer Pipe and Fittings

CAMP WILLIAMS
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- H. AWWA C600 Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances
- I. ANSI A21.10 Gray and Ductile Iron Fittings 2-inch through 48-inch for Water and Other Liquids
- J. ANSI A21.11 Rubber Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings
- K. ANSI A21.50 Thickness Design of Ductile-Iron Pipe
- L. ANSI A21.51 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids

1.05 SUBMITTALS

- A. Submit for review and approval, data on fabricated grates and frames to be used, including dimensions, weights, manufacturer, product number, and other related information.
- B. All reinforced pre-cast concrete structures shall be submitted for review and approval with suitable detail to show all necessary dimensions and reinforcing.

PART 2 - PRODUCTS

2.01 PIPE

- A. Storm Drains
 - 1. High Density Polyethylene (Smooth Interior Corrugated). AASHTO M-294 Type S, Advanced Drainage Systems ADS N-12 or approved equal.
 - a. Joints. Push-on rubber gasket
 - b. Fittings. Polyvinyl Chloride (PVC), ASTM D3034, cell classification SDR, and joints to meet pipe requirements for PVC piping.
 - 2. Reinforced Concrete Pipe. ASTM C76, Type II cement, bell and spigot joints with rubber compression gaskets conforming to ASTM C443. Class III or as indicated on the drawings. In addition to the requirements of the referenced standards above, pipe shall not be installed prior to seven (7) days from the date of manufacture as marked on each pipe.
 - 3. Polyvinyl Chloride (PVC). ASTM D3034, SDR 35, unless otherwise indicated on the drawings.
 - a. Cell Classification. 12454B

CAMP WILLIAMS
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- b. Joints. Solvent cement or bell and spigot with integral bell elastomeric gasket joint.
 - c. Fittings. ASTM D3034, cell classification SDR, and joints to meet pipe requirements for PVC piping
- B. Roof Drain Laterals, 4-inch, 6-inch, 8-inch diameter. Pipe for roof drain laterals shall be same type as provided for storm drains.
- 1. Concrete. ASTM C14, Class 3 unless otherwise indicated on the drawings.
 - a. Cement. ASTM C150, Portland Cement Type II (or IIA)
 - b. Joints. ASTM C443, Bell and Spigot Type
 - 2. High Density Polyethylene (Smooth Interior Corrugated, double-wall). Advanced Drainage Systems ADS N-12 or approved equal.
 - a. Joints. Push-on rubber gasket
 - b. Fittings. Polyvinyl Chloride (PVC), cell classification SDR, and joints to meet pipe requirements for PVC piping.
 - c. Perforations, where required on the drawings: corrugation valleys only; ASTM F405 and F667.
 - 3. Polyvinyl Chloride (PVC). ASTM D3034, SDR 35, unless otherwise indicated on the drawings.
 - a. Cell Classification. 12454B
 - b. Joints. Solvent cement or bell and spigot with integral bell elastomeric gasket joint
 - c. Fittings. ASTM D3034, cell classification SDR, and joints to meet pipe requirements for PVC piping.

2.02 CONCRETE

- A. All concrete for construction of inlet boxes, catch basins, and appurtenances shall be in accordance with Section 03300 - Cast-In-Place Concrete.
- B. Mix shall contain not less than 6½ bags of Type II cement per cubic yard. Maximum aggregate size shall be 1¾ inches.

2.03 MORTAR (GROUT)

- A. Mortar for jointing inlet boxes shall be one (1) part Portland Cement and not less than one (1) part nor more than 1½ part plaster sand, mixed with the least amount of water necessary to provide a workable mortar.

2.04 REINFORCING STEEL

CAMP WILLIAMS
JLTC BUILDINGS 1-4

Reinforcement shall be Grade 60, in accordance with Section 03200 - Concrete Reinforcement.

2.05 CATCH BASINS

- A. Catch Basins. Pre-cast or cast-in-place concrete conforming to the drawings.
- B. The use of pre-cast catch basins shall be subject to approval by the Contractor. Subcontractor shall submit shop drawings for each type of pre-cast box. Coordination for elevations shall remain the Subcontractor's responsibility.
- C. Cast-Iron Frame and Grated Covers. ASTM A48, Class 30, of uniform quality, free from blow holes, porosity, hard spots and shrinkage defects, with non-rocking, machined bearing surfaces between frame and cover. The frame and cover shall be cleaned and painted with an asphalt coating prior to delivery to the site. Frame and grates shall meet AASHTO HS-20 loading requirements.

Frame and grate covers shall be heavy-duty type as noted on the plan.

- D. Grout. Non-shrink.

2.06 CATCH BASINS (GUTTER TYPE)

- A. Inlet Boxes. Pre-cast or cast-in-place concrete conforming to the drawings.
- B. The use of pre-cast inlet boxes shall be subject to approval by the Contractor. Subcontractor shall submit show drawings for each type of pre-cast box. Coordination for elevations shall remain the Subcontractor's responsibility.
- C. Cast-Iron Frame and Grate. ASTM A48, Class 30, of uniform quality, free from blow holes, porosity, hard spots, and shrinkage defects with non-rocking, machined bearing surfaces between ring and cover. The ring and cover shall be cleaned and painted with an asphalt coating prior to delivery to the site.
- D. Frame and grates shall be heavy-duty type as noted on the plan.

2.07 MANHOLES

- A. Concrete Pre-Cast Sections. ASTM C478, 48-inch inside diameter unless otherwise noted on the drawings.
 - 1. Cement. ASTM C150 Portland Cement Type IIA Modified or Type V
 - 2. Base Section. Base riser with integral floor
 - 3. Cone Section. Concentric cone
 - 4. Pipe connectors

CAMP WILLIAMS
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- a. Flexible rubber boot. ASTM C023 with stainless steel clamping and retaining bands.
 - b. Pipe stubs. Same material, class, and requirements as connecting piping.
- B. Cast-in-Place Base Section
1. Concrete
 - a. Use 28-day minimum compressive strength, 3000 psi.
 - b. Use minimum 5½ bags of cement per cubic yard.
 - c. Use Type IIA Modified or Type V cement conforming to ASTM C150.
 2. Pipe Connectors. Use pipe stubs of same material, class, and requirements as connecting piping.
- C. Grade Rings. ASTM C478, Type IIA Modified or Type V cement conforming to ASTM C150.
- D. Frame and Cover. ASTM A48, Class 35 Gray-Iron
1. Use non-vented covers with a pick hole for opening.
 2. Use low-profile waffle pattern cover.
 3. Use cover with the words "STORM DRAIN."
 4. Use frame and cover with machined bearing surfaces.
 5. Use non-slotted frame.
 6. Repair of defects in castings by welding or other methods will not be permitted.
 7. Acceptable Manufacturers D&L Supply. A 1181 WP
 8. Grout. Non-shrink type.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to excavating for storm drain lines, verify locations of existing utilities. Notify Contractor of any conflicts with proposed alignment and grade.
- B. Line and Grade. Establish the line and grade of the storm drain line. A laser designated for such work shall be used to establish line and grade. The length of line between laser set-ups shall not exceed 500 feet. Other methods for maintaining line and grade must be approved by Contractor prior to construction.
- C. Prior to installation, inspect all pipes, manholes, and appurtenances for cracks, defects, or imperfections, and verify compliance with the specifications. Remove all defective material from the site.

CAMP WILLIAMS
JLTC BUILDINGS 1-4

3.02 EXCAVATING, BACKFILLING, AND COMPACTING

Refer to Section 02222 - Excavating, Backfilling, and Compacting for Utilities.

3.03 PIPE LAYING

- A. Lay pipe to line and grade indicated.
- B. After being cleaned and inspected for soundness, each piece of pipe shall be laid on the previously graded trench bottom or bedding material, as required, after the bell hole has been excavated.
- C. Lay bell and spigot type pipe with the bell end upgrade. Pipe laying shall proceed upgrade.
- D. Trenches shall be dewatered and under no circumstances shall pipe be laid in water, nor shall the pipe be laid under unsuitable weather or trench conditions.
- E. Every precaution shall be taken to prevent foreign material from entering the pipe during installation. No debris, tools, clothing, or other material shall be placed in the pipe.
- F. At times when pipe laying is not in progress or at other times during construction as directed by the Contractor, the open end of the pipe shall be closed by a watertight plug or other means approved by the Contractor.
- G. Pipe installation and jointing for the various types of pipe specified shall be according to these specifications and the manufacturer's recommendations.
 - 1. Concrete Pipe. Manufacturer's recommendations.
 - 2. Ductile-Iron Pipe. AWWA C600 and manufacturer's recommendations.
 - 3. High density Polyethylene (HDPE) Pipe. ASTM D2321
 - 4. Polyvinyl Chloride (PVC) Pipe. ASTM D2321

3.04 INSTALLATION OF ROOF DRAIN LATERAL PIPING

- A. Pipe installation and joining for the various types of pipe specified shall be according to these specifications and the manufacturer's recommendations.
- B. Install piping at a grade of two (2) percent minimum and make connections to the storm drainage system at or above spring line or at elevation indicated on the drawings. Provide four (4) feet minimum cover if available.
- C. Install cleanouts when indicated, five (5) feet from buildings and in accordance with the drawings. Risers shall be the same size and material as the piping.

CAMP WILLIAMS
JLTC BUILDINGS 1-4
3.05 CATCH BASIN INSTALLATION

- A. Install catch basins at location and grades indicated.
- B. Pre-cast boxes. Place so as to be uniformly supported in proper alignment. Place compacted bedding material under pre-cast boxes if required to provide uniform and stable support.
- C. Cast-in-place boxes. Constructed in accordance with the drawings.
- D. Grade adjustment. Set catch basin or inlet box to final grade only after final elevation of pavement, gutter, ditch, or sidewalk in which it is to be placed has been established.
- E. Pipe connection. Grout openings in walls of pre-cast boxes with non-shrink grout after pipe and castings have been placed to their final position.
- F. Pre-cast boxes shall be placed and aligned to provide vertical sides.
- G. Grade rings. A maximum of 12 inches of grade rings will be allowed. If possible, one (1) grade ring should generally be installed on catch basins located in landscaped areas.
- H. Joints and lift holes. All lift holes and joints between pre-cast boxes, grade rings, or castings shall be sealed by placing a continuous bead of bitumastic material sufficient to fill the void in the joint prior to joining the items.
- I. Frame and cover installation
 - 1. In roadways. Top of casting shall be set parallel to and $\frac{1}{2}$ to $\frac{3}{4}$ inch below finished road surface. Castings shall be fully and uniformly supported. Wedges or shims used to elevate castings shall be brick or metal with concrete placed for uniform support.
 - 2. Off road. Top of castings shall be set as indicated on drawings.
- J. Any catch basins displaced or damaged prior to final acceptance shall be removed and replaced to conform to these specifications at the Subcontractor's expense.

3.06 MANHOLE INSTALLATION

- A. Install manholes at locations and grades indicated.
- B. Pre-cast bases. Place so as to be fully and uniformly supported in proper alignment. Place compacted bedding material under pre-cast base if required to provide uniform and stable support.

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- C. Cast-in-place base. Provide a continuous pour of the concrete with at least 6 inches of concrete below the invert of the manhole and at least 6 inches radially outside of the outside diameter of the pre-cast riser section. The concrete shall also extend a minimum of 6 inches above the bottom of the riser section around the outside of the manhole.
1. Support bottom pre-cast riser section on concrete blocks and adjust to proper alignment and grade prior to pouring the cast-in-place base.
 2. The pre-cast riser section shall not bear directly on any of the pipes.
 3. Grout all joints between cast-in-place concrete and pre-cast sections and pipe with non-shrink grout after concrete has cured.
- D. Inverts
1. Construct smooth and uniform changes in flow direction with the longest radius possible.
 2. Provide cross-sectional shape of the invert channels to match the lower halves of the inflow and outflow pipes.
 3. Extend pipes into the manhole a maximum of three (3) inches from the inside of the manhole wall.
- E. Place and align pre-cast sections to provide vertical sides.
- F. Grade rings. Provide manhole wall sections to allow for a maximum of 12 inches of grade rings on manholes located in roadways. Provide adequate manhole wall sections to avoid the use of grade rings or manholes located off roadways.
- G. Joints and lift holes. Seal all joints between pre-cast base, riser and cone sections, grade rings and castings by placing a continuous bead of mastic sealant in the joint prior to joining the items, and touching up the mastic sealant, adding additional mastic sealant as required to form a smooth, watertight joint both inside and outside with mastic sealant. In all cases, a watertight manhole is required.
- H. Ring and cover installation
1. In roadways. Set top of casting parallel to and $\frac{1}{2}$ to $\frac{3}{4}$ inch below finish road surface. Support castings fully and uniformly. Use brick or metal wedges or shims to finely adjust castings to grade. Place concrete around wedges and shims for uniform support.
 2. Off road. Top of casting shall be set approximately 6 inches above finish grade unless otherwise indicated or directed by the Contractor.

CAMP WILLIAMS
JLTC BUILDINGS 1-4

- I. Any manhole displaced or damaged prior to final acceptance shall be removed and replaced to conform to these specifications at the Subcontractor's expense.

3.07 FIELD QUALITY CONTROL

Visual inspection will be performed on all installed storm drain lines prior to acceptance. The Contractor will perform a visual inspection of all installed storm drain lines and manholes to assure conformance with the specifications. All sections of storm drain line will be "lamped" to insure that the line is straight, of uniform grade, and free of all dirt, debris, and obstructions. All broken, misaligned, or displaced pipe and manholes or other defects revealed during this visual inspection shall be corrected at the Subcontractor's expense. The Subcontractor shall furnish suitable assistance to the contractor for visual inspections.

3.08 CLEANING

- A. The interior of all storm drain lines, manholes, catch basins, and other appurtenances shall be cleaned of all dirt, debris, or other foreign material. Cleaning shall be by flushing, jetting, or other approved means to remove such foreign material.
- B. Connections between new construction and the existing system shall be plugged to prevent any debris from the new construction or from cleaning operations from entering the existing system. Any debris entering the existing system shall be removed at no expense to the construction manager.

END OF SECTION 02720

SECTION 01110
SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work under this project includes construction of UTAH NATIONAL GUARD JLTC PARKING LOT IMPROVEMENTS PHASE 1, in accordance with the Contract Documents.

B. The Work consists of the items shown on the plans and the following:

Additive Alternate 1:

Price of asphalt and striping for half of the parking lot: _____

Price of asphalt and striping for all of the parking lot: _____

C. The Owner intends to issue one contract for all Work related to Phase 1.

1.02 CONTRACT METHOD

The Contract is a lump sum contract. All Work will be paid for based on the lump sum amount for the work done at the lump sum price bid. Work not performed will be credited back to the owner.

1.03 CONTRACT TIME

The Contract time and completion dates shall be as defined in the Agreement.

1.04 PROJECT DESCRIPTION

A. The Work covered by this Contract will be performed on-site as shown on the drawings.

PART 2 - PRODUCTS

2.01 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

A. The Contractor shall furnish and install all materials and equipment required by the Contract Documents which are necessary to complete the Work as shown on the drawings and specified herein and render the system operational.

CAMP WILLIAMS
JLTC BUILDINGS 1-4

- B. All materials incorporated into the Work shall be in accordance with applicable governmental standards, and as specified herein and shown on the drawings.
- C. All material to be incorporated into the Work shall meet the approval of the Engineer prior to placement. Any material rejected by the Engineer shall be removed from the site. Any material incorporated into the Work prior to approval of the Engineer shall be removed and replaced at the request of the Engineer. Removal and replacement of any unapproved material shall be at the Contractor's expense and at no cost to the Owner.

PART 3 - EXECUTION

3.01 STAGING AREAS

Staging areas will be determined on site during the pre-construction meeting. The Contractor is responsible for construction facilities.

3.02 TRAFFIC CONTROL

The Contractor shall provide traffic control and construction signage in accordance with applicable government regulations. Vehicular and pedestrian access to neighboring properties shall be maintained at all times.

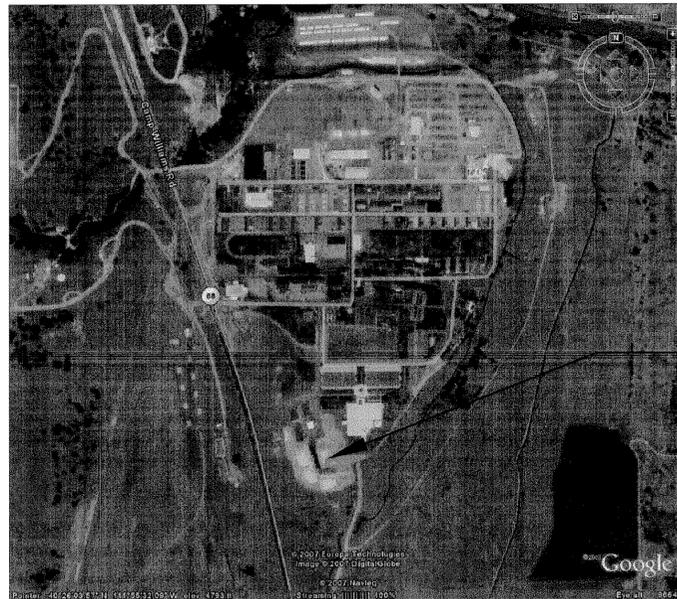
3.03 CONSTRUCTION PERMIT

The Contractor shall obtain, if necessary, a construction permit prior to construction and shall fulfill all requirements of such permit.

END OF SECTION 01110

CAMP WILLIAMS JLTC BUILDINGS 1-4

PHASE 1 FINAL CONSTRUCTION DRAWINGS



VICINITY MAP

INDEX OF DRAWINGS

GI-001	COVER SHEET
CS-101	GRADING PLAN
CS-501	GRADING/UTILITY DETAILS

CONTACT INFORMATION FOR PROJECT

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LANDSCAPE ARCHITECT	THOMAS MCKENNA	801-261-0090
CIVIL ENGINEER	KEN ENGSTROM	801-261-0090
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COVER SHEET
SCALE: NTS



State of Utah
Department of Administrative Services

Division of Facilities
Construction & Management
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Salt Lake City, Utah 84114
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CREATED BY:



Stantec

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CONSULTANTS:



BUILDING NAME:

UTAH NATIONAL
GUARD
JLTC

PROJECT TITLE:

BUILDINGS 1-4
CAMP WILLIAMS

MARK	DATE	DESCRIPTION
▲	08-11-08	ADDENDUM 1

ISSUE TYPE: PH. 1 FINAL CONST. DWGS

ISSUE DATE: JULY 7, 2008

DFCM PROJECT NO: 070111480

CAD PROJECT NO: -

CAD DWG FILE:

DRAWN BY: TGM

CHK'D BY: TGM

COPYRIGHT: STATE OF UTAH

SHEET TITLE

COVER
SHEET

SHEET NUMBER

GI-001

SHEET 01 OF 2

CREATED BY:



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BUILDING NAME:

UTAH NATIONAL
GUARD
JLTC

PROJECT TITLE:

BUILDINGS 1-4
CAMP WILLIAMS

08-11-08 ADDENDUM 1

MARK DATE DESCRIPTION

ISSUE TYPE: FINAL CONSTRUCTION DRAWINGS

ISSUE DATE: JULY 17, 2007

DFCM PROJECT NO: 070111480

CAD PROJECT NO: --

CAD DWG FILE:

DRAWN BY: JLS

CHK'D BY: KAE

COPYRIGHT: STATE OF UTAH

SHEET TITLE

GRADING/UTILITY
DETAILS

SHEET NUMBER

CS-501

SHEET 05 OF 9

1

2

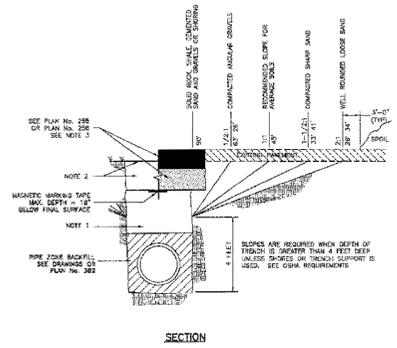
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5

Trench backfill

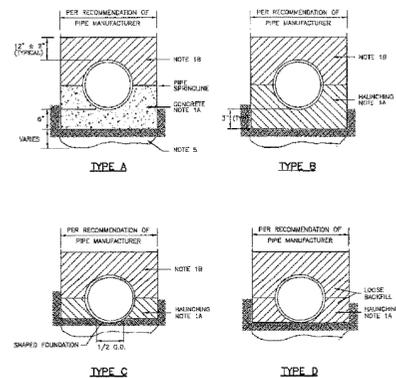
- BACKFILL: Limit maximum particle size in trench backfill material to 6 inches.
 - Backfill Material: Place backfill per APWA Section 02021. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction. Do not use clay without ENGINEER review and acceptance.
 - Flowable Fill: Provide and place controlled low strength material per APWA Section 02062. Cure the fill before placing surface materials.
- LANDSCAPED RESTORATION: Provide landscaped surfaces with topsoil. Rake to reach existing grade. Replace vegetation to match pre-construction conditions. See APWA Section 02324 or 02322 requirements.
- PAVEMENT RESTORATION: Do not install asphalt or concrete surfacing until trench compaction is accepted by ENGINEER.
- PEA GRAVEL: PEA gravel and "squeegy" is not allowed in any part of the trench.



Trench backfill
Plan No. 381
Revised July 2000

Pipe zone bedding

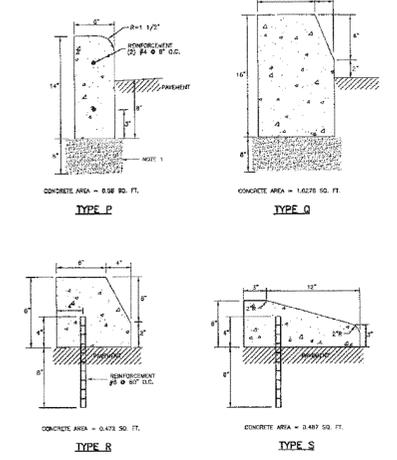
- BACKFILL:
 - Pipe Zone Below Pipe Springing: Furnish bedding material allowed by pipe manufacturer. Install and compact bedding material per pipe manufacturer's recommendations. When using concrete, provide at least Class 2 000 per APWA Section 0304. Submission of quality control compaction test result data developed for haunching areas may be requested by ENGINEER at any time. CONTRACTOR is to provide results of tests immediately upon request.
 - Pipe Zone Above Pipe Springing: Limit particle size to 2-inches maximum. Place in lifts not exceeding 8-inches before compaction per APWA Section 02321. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater unless pipe manufacturer requires more stringent installation.
 - Flowable Fill: Provide and place controlled low strength material per APWA Section 02062 if allowed by pipe manufacturer. Reset pipe to line and grade if pipe "floats" out of position.
- PIPE ZONE WIDTH: Provide width recommended by pipe manufacturer. Width of pipe zone is measured at the pipe springing and includes any necessary sheathing.
- PIPE LOCATION: Install pipe in center of trench or no closer than 6 inches from wall of pipe to wall of trench.
- PEA GRAVEL: PEA gravel and "squeegy" is not allowed in any part of the pipe zone except where specified for dewatering piping systems.
- FOUNDATION STABILIZATION: Use sewer rock of APWA Section 02060. Installation of stabilization-separation geotextile per APWA Section 02075 will be required to separate backfill material and native subgrade materials if sewer rock cannot provide a working surface.



Pipe zone bedding
Plan No. 382
Revised August 2001

Curbs

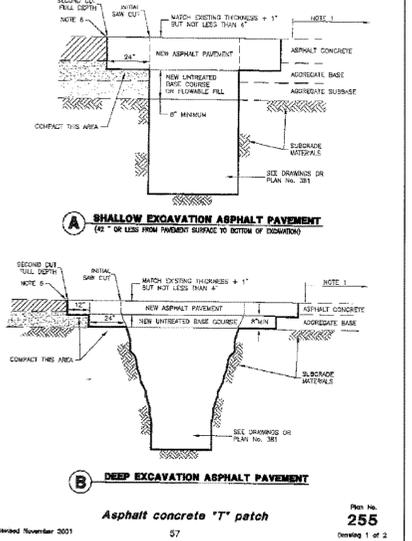
- UNTREATED BASE COURSE: Provide material specified in APWA Section 02060. Do not use gravel or spherulite. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
- CONCRETE: Class 4000 per APWA Section 03304. Place per APWA Section 02770. Cure per APWA Section 03390.
 - If necessary, provide concrete that achieves design strength in less than 7 days. Use caution, however, as spider cracks develop if air temperature exceeds 90 degrees F.
 - Unless shown otherwise, provide 1/2 inch radius on concrete edges exposed to public view.
- EXPANSION JOINTS:
 - Full depth 1/2 inch thick type F1 joint filler material per APWA Section 03060. Place filler at 60 feet intervals maximum with top of filler set flush with surface of concrete.
 - Expansion joints are not required in slip formwork except at the start or end of the installation activity, and at the start or end of a street intersection curb radius return.
- CONTRACTION JOINTS: Place joints at 10 foot intervals. Make all joints at least 1/8 inch wide and 2 inches deep or 1/4 slab thickness if the slab is greater than 8 inches thick.
- REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03200 requirements.



Curbs
Plan No. 209
Revised July 2000

Asphalt concrete "T" patch

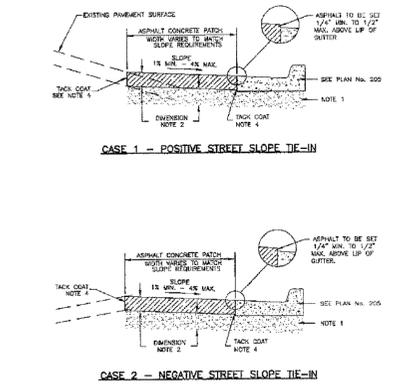
- ADDITIONAL PAVEMENT REMOVAL: Remove additional pavement to a painted line strip, a lip of gutter, a curb, an existing pavement patch, or an edge of the pavement if such street feature is within 2-feet of the second saw-cut.
- UNTREATED BASE COURSE: Provide material specified in APWA Section 02060. Do not use gravel or spherulite. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
- FLOWABLE FILL: Provide 28-day 60-psi controlled low strength material as specified in APWA Section 02062. Use fill which flows easily and vibration is not required. Cure to full set before placing new untreated base course or new asphalt pavement. Use flowable fill in excavations that are too narrow to receive compaction equipment.
- TACK COAT: Full tack coat coverage on all vertical surfaces.
- ASPHALT PAVEMENT: Use asphalt concrete specified in APWA Section 02065.
 - Install in lifts no greater than 3-inches after compaction.
 - Compact within the range of 95 to 98 percent relative to the ASTM D 5691 (Marshall method) or 93 to 97 percent relative to ASTM D 2041 (Rise method). Compact to surface elevations that exceed 1/4 inch deviation in 10 feet. Coat placed surfaces with a cationic or anionic emulsion that complies with Section 02703.
- JOINT REPAIR: If a crack occurs at the "T" patch connection to existing pavement or at any street feature, seal the crack per APWA Section 02075.
- PATCH REPAIR: Repair the asphalt pavement patch if any of the following conditions within the patch occur:
 - Cracks at least 1-foot long and 1/4-inch wide occur more often than 1 in 10 square feet.
 - Pavement surface distortion exceeds 1/4-inch deviation in 10-foot.
 - Asphalt raveling is greater than 1 square foot per 100 square feet.



Asphalt concrete "T" patch
Plan No. 255
Revised November 2001

Asphalt pavement tie-in

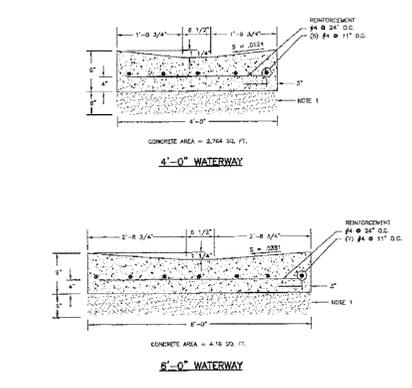
- UNTREATED BASE COURSE: Provide material specified in APWA Section 02060. Do not use gravel or spherulite. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
- DIMENSION:
 - Match existing thickness of aggregate base or 8" minimum.
 - Match adjacent asphalt concrete thickness plus 1 inch to a maximum of 6 inches in residential streets and 9 inches in non-residential streets. Install asphalt concrete in lifts no thicker than 3" before compaction.
- ASPHALT CONCRETE PAVEMENT JOINTS: Provide a neat straight joint between existing and new asphalt concrete. Saw-cut joint if existing pavement exceeds 2 inches in thickness or if portland cement concrete underlies asphalt concrete pavement. See demotion requirements in APWA 02222.
- TACK COAT: Clean all vertical surfaces adjacent to the patch. Apply full coverage tack coat per APWA Section 02709.



Asphalt pavement tie-in
Plan No. 251
Revised March 2000

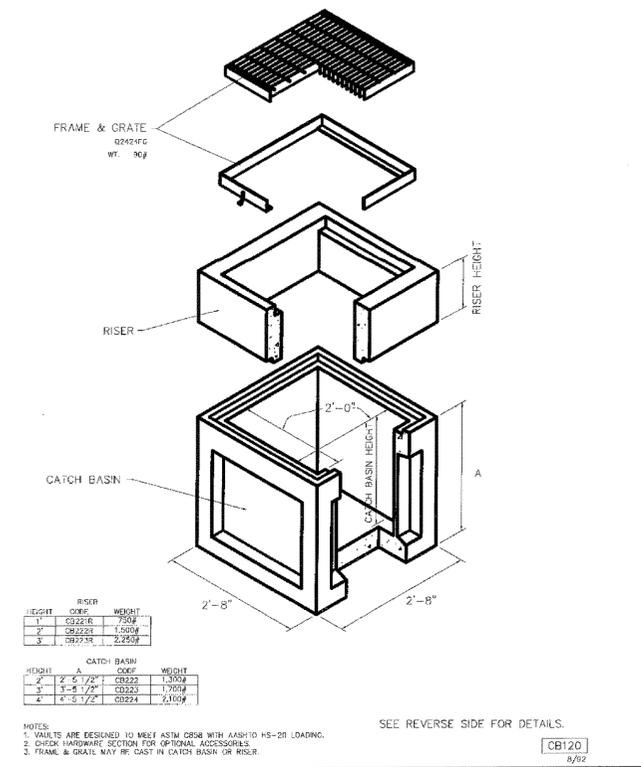
Waterway

- UNTREATED BASE COURSE: Provide material specified in APWA Section 02060. Do not use gravel or spherulite. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
- CONCRETE: Class 4000 per APWA Section 03304. Place per APWA Section 02770. Cure per APWA Section 03390.
 - If necessary, provide concrete that achieves design strength in less than 7 days. Use caution, however, as spider cracks develop if air temperature exceeds 90 degrees F.
 - Unless shown otherwise, provide 1/2 inch radius on concrete edges exposed to public view.
- EXPANSION JOINTS: Full depth 1/2 inch thick type F1 joint filler material per APWA Section 03060. Set top of filler flush with surface of concrete.
- CONTRACTION JOINTS: Make contraction joints vertical, at least 1/8 inch wide, and 2 inches deep or 1/4 slab thickness if the slab is greater than 8 inches thick.
- REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03200 requirements.



Waterway
Plan No. 211
Revised June 2000

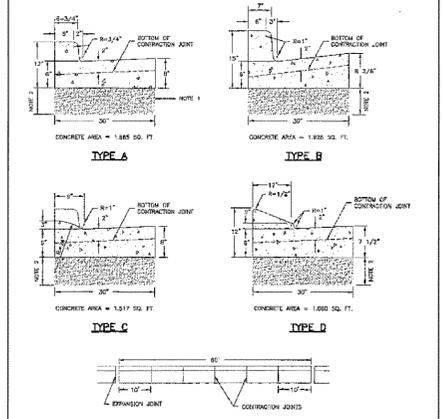
2' x 2' CATCH BASIN



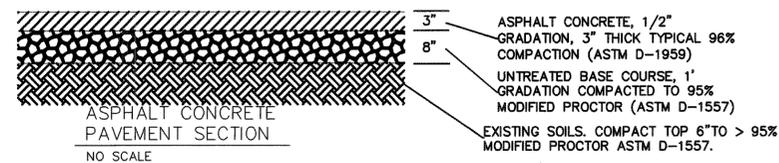
Catch Basin
Plan No. 205
Revised August 2001

Curb and gutter

- UNTREATED BASE COURSE: Provide material specified in APWA Section 02060. Do not use gravel or spherulite. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
- DIMENSION: For curb and gutter with flowline grades greater than 0.5 percent (s = 0.005) roadbase dimension is 8 inches. For curb and gutter with flowline grades less than 0.5 percent roadbase dimension is 8 inches.
- CONCRETE: Class 4000 per APWA Section 03304. Place per APWA Section 02770. Cure per APWA Section 03390.
 - If necessary, provide concrete that achieves design strength in less than 7 days. Use caution, however, as spider cracks develop if air temperature exceeds 90 degrees F.
 - Unless shown otherwise, provide 1/2 inch radius on concrete edges exposed to public view.
- EXPANSION JOINTS:
 - Full depth 1/2 inch thick type F1 joint filler material per APWA Section 03060. Set top of filler flush with surface of concrete.
 - Expansion joints are not required in slip formwork except at the start or end of the installation activity, and at the start or end of a street intersection curb radius return.
- CONTRACTION JOINTS: Make contraction joints vertical, at least 1/8 inch wide, and 2 inches deep or 1/4 slab thickness if the slab is greater than 8 inches thick. In less than 10 feet horizontal spacings, match location of contraction joints in portland cement concrete roadway pavements.



Curb and gutter
Plan No. 205
Revised August 2001



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