UNIVERSITY OF COLORADO
BOULDER, COLORADO

CAMPUS DISTRIBUTION ENHANCEMENTS
TUNNEL #6 PHASE 2 BID DOCUMENTS

FACILITIES MANAGEMENT DEPARTMENT
UNIVERSITY OF COLORADO
BUILDING RL-2
BOULDER, COLORADO 80309-0160

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  S4.4 - DETAILS
  S4.5 - DETAILS

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UNIVERSITY OF COLORADO AT BOULDER
CAMPUS DISTRIBUTION
ENHANCEMENTS
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COVER SHEET
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S4.5 - DETAILS
NYOPLAST DRAIN BASIN

Inlet Protection (IP)

IP-3. ROCK SOCK SUMP/AREA INLET PROTECTION

IP-4. SILT FENCE FOR SUMP INLET PROTECTION

November 2000

Urban Storm Drainage Criteria Manual Volume 3
**SYMBOL LEGEND**

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**MECHANICAL GENERAL NOTES:**

1. All mechanical equipment and system components shown herein shall be installed in accordance with applicable codes and standards. The contractor shall coordinate with the University of Colorado's Project Manager.

2. The contractor shall obtain "Authorization to Proceed with Construction" from the University of Colorado prior to beginning any construction activities.

3. The contractor shall follow the University of Colorado's Project Manager's instructions and guidelines.

4. The contractor shall provide a detailed written method of procedure when a construction activity affects the safety of occupants, telephone/data/fire alarm equipment, or components of any system which supports this equipment or essentially affects the building management, operations, or security.

5. The contractor shall establish a safety plan and submit a copy to the University for review prior to performing any work included in the contract.

6. Improvements shown on the drawings have been taken from owner furnished drawings and/or limited field observations. Contractor, Ramsey & Associates is not responsible for the accuracy of any improvements shown on the drawings.

7. The contractor shall ensure that all work is performed in accordance with the University of Colorado's Project Manager's instructions and guidelines.

**ELECTRICAL GENERAL NOTES:**

1. All electrical work shall be performed in accordance with the National Electrical Code (NEC) and all applicable local codes.

2. The contractor shall coordinate with the University of Colorado's Project Manager.

3. The contractor shall obtain "Authorization to Proceed with Construction" from the University of Colorado prior to beginning any construction activities.

4. The contractor shall follow the University of Colorado's Project Manager's instructions and guidelines.

5. The contractor shall provide a detailed written method of procedure when a construction activity affects the safety of occupants, telephone/data/fire alarm equipment, or components of any system which supports this equipment or essentially affects the building management, operations, or security.

6. The contractor shall establish a safety plan and submit a copy to the University for review prior to performing any work included in the contract.

7. Improvements shown on the drawings have been taken from owner furnished drawings and/or limited field observations. Contractor, Ramsey & Associates is not responsible for the accuracy of any improvements shown on the drawings.

**NOTES:**

1. The designs shown herein including all technical drawings, graphic representation, and models thereof, are the sole and express written permission from the University of Colorado at Boulder. The designs shall not be reproduced or commercially exploited in whole or in part without the written permission of the University of Colorado at Boulder.

2. The designs shown herein shall not be altered or modified without the written permission of the University of Colorado at Boulder.

3. The designs shown herein shall be used solely for the purpose of constructing the improvements shown on the drawings. The designs shall not be used for any other purpose.

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THE DESIGN TEAM AND UNIVERSITY ASSUMES NO RESPONSIBILITY FOR UTILITY LOCATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE SIZE, MATERIAL, HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.

CALL 811 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR MARKING OF UNDERGROUND MEMBER UTILITIES.

COCKERELL DRIVE
BExp Drive
BAKER DRIVE
LIBBY HALL
FARRAND FIELD
FARRAND HALL
WILLARD HALL
HALLETT HALL
CONTRACTOR TO CONSULT THE CAMPUS LANDSCAPE ARCHITECT TO CONFIRM THE DESIRED CONTROL JOINT PATTERN PRIOR TO PLACING CONCRETE.

(E) SUB-SURFACE CONCRETE CURBS AT ASPHALT LIMITS TO BE REMOVED

(N) CONCRETE APRON TO BE 6" MIN. THICKNESS AND BE REINFORCED W/ #4 @ 12"OC EA WAY IN THE CENTER OF THE SLAB, FOR MORE INFO SEE

(E) SUB-SURFACE CONCRETE CURBS AT ASPHALT LIMITS TO BE REMOVED

(E) SIDEWALK CONTROL JOINTS

WORK POINT FOR NEW Control JOINTS WORK POINT FOR NEW Control JOINTS

CONTROL JOINT PER ADD ALTERNATE #2 PAVING

SAWCUT (E) SIDEWALK PERPENDICULAR TO THE EDGE AT THE NORTH Most LOCATION OF THE ASPHALT TO BE REMOVED

CONCRETE SIDEWALK FOR BIDDING PURPOSE, ASSUME CONCRETE TO BE REMOVED CONTAINS REINFORCING

CONTROL JOINTS BETWEEN WORK POINTS 31'-10" ±

8'-6" ±

31'-0" ±

23' - 0" ±

43'-3" ±

9'-0" ±

5'-0" ±

8'-6" ±

DESIGNERS:

DATE PRINTED:

MM JOB #:

PRINCIPAL:

EOR:

PROJECT MANAGER:

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IN LIEU OF THE ISOLATED TUNNEL LID REPAIRS IN THIS AREA, REMOVE THE ENTIRE TUNNEL LID AND ASPHALT BIKE PATH AND REPLACE PER BIDDING PURPOSES ASSUME TOTAL LENGTH IS APPROX 175'-0". PRICING FOR THIS ADD ALTERNATE SHALL ADDRESS THE CREDIT FOR THE ISOLATED REPAIRS AND THE COST FOR THE CONTINUOUS REPLACEMENT SHOWN ON THIS PLAN AND ASSOCIATED DETAILS.

S4.4

CONTRACTOR TO CONSULT THE CAMPUS LANDSCAPE ARCHITECT FOR THE DESIRED NORTH/SOUTH CONTROL JOINT LOCATIONS AND SPACING PRIOR TO PLACING CONCRETE.

(N) CONSTRUCTION / CONTROL JOINT IN NEW SLAB TO ALIGN WITH THE EXTERIOR FACE OF THE NORTH TUNNEL WALL BELOW, SEE AT NON-STEAM ANCHOR SUPPORT RACKS, INSTALL EMBED PL IN NEW TUNNEL LID ABOVE EACH EXISTING UTILITY SUPPORT RACK. CONNECT (E) RACK PLATE PER TYP OF 2 LOCN'S THIS SHEET AT STEAM ANCHOR RACK LOCATIONS, INSTALL ENLARGED EMBED PLATE PER TYP OF 2 LOCN'S THIS SHEET.

2. DENOTES AREA WHERE THE STRUCTURAL TUNNEL LID IS TO BE REPLACED. CONTRACTOR TO PROVIDE SHORING AND TEMPORARY LOCATION OF ALL SUPPORTS AGREED TO COMPLETE THESE WORKS.

3. ALL KITCHENS AND COOKING AREAS TO BE RENOVATED AND REPLACED WITH CONCRETE.

4. LIBBY HALL CONTINUES.

5. CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY BRACING FOR ALL EXISTING UTILITY SUPPORT RACKS WITHIN THE REPAIR AREA.

NOTES:

1. DIMENSIONS GIVEN ON THIS PLAN ARE APPROXIMATE FOR BIDDING PURPOSE ONLY CONTRACTOR TO VERIFY EXACT DIMENSIONS PRIOR TO CONSTRUCTION.

2. DENOTES AREA OF (E) ASPHALT OR CONCRETE PAVING TO BE REMOVED AND REPLACE WITH CONCRETE.

3. DENOTES AREA OF (E) CONCRETE PAVING TO BE REMOVED AND REPLACED.

5. CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY BRACING FOR ALL EXISTING UTILITY SUPPORT RACKS WITHIN THE REPAIR AREA.

THE DESIGNS SHOWN HEREIN INCLUDING ALL TECHNICAL DRAWINGS, GRAPHIC REPRESENTATION & MODELS THEREOF, ARE PROPRIETARY & CAN NOT BE COPIED, DUPLICATED, OR COMMERCIAL EXPLOITED IN WHOLE OR IN PART WITHOUT THE SOLE AND EXPRESS WRITTEN PERMISSION FROM MARTIN/MARTIN, INC.

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DESIGNERS:

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PRINCIPAL:

EOR:

PROJECT MANAGER:
SOUTH EDGE OF TUNNEL
LID REPAIR TO BE LOCATED
SUCH THAT THE EXISTING
SURFACE GRATE WILL BE
REMOVED AND DISCARDED

TUNNEL LID REPAIRS

REMOVABLE CONCRETE LID TO REMAIN
(E) REMOVABLE CONCRETE LID TO BE DISCARDED

TUNNEL 6 CONTINUES.

APPROX 300 SQ FT
APPROX 60 SQ FT
APPROX 120 SQ FT

AT STEAM ANCHOR T6L-AN1, INSTALL ENLARGED PLATE PER S4.4
TO ACCOMMODATE FUTURE REPLACEMENT OF STEAM ANCHOR

AT NON-STEAM ANCHOR SUPPORT RACKS, INSTALL EMBED PL IN NEW TUNNEL LID ABOVE EACH EXISTING UTILITY SUPPORT RACK. CONNECT (E) RACK PLATE PER TO ACCOMMODATE FUTURE REPLACEMENT OF BRANCH RACK.

NOTES:
1. DENOTES APPROXIMATE LOCATION OF DETEORIATED TUNNEL LID TO BE REPLACED.
CONTRACTOR TO PROVIDE SHORING AND TEMPORARY UTILITY PIPE RACK SUPPORTS AS REQD TO COMPLETE THIS WORK.

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BEN BROMIEL
BEN BROMIEL
BEN NELSON

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LONGITUDINAL DEMO SECTION (LIBBY ENTRANCE)

1. It is not anticipated that the high voltage haunch is present within the Libby Branch of the tunnel. However, the Contractor shall take all precautions necessary to verify the presence or lack of all utilities prior to beginning any demolition. Use extreme caution in removing the tunnel lid.

2. Temporarily remove all existing MEP items supported by the (E) lid, or.

3. Remove portion of (E) utility rack above existing wall to remain, see Demo Note 2.

4. Contractor shall design and install temporary bracing for all associated utility racks, including reinstallation of all utilities shown on this drawing. Contractor to provide top portion of (E) utility rack to remain.

5. Contractor shall design and install temporary bracing to resist 1500 lb/ft service load (compression) for all existing utility racks within demo/reconstruction area to remain in place until the final connections to the new lid are complete per official notes.

6. Contractor shall design and install temporary bracing to resist 1500 lb/ft service load (compression) for all existing utility racks within demo/reconstruction area to remain in place until the final connections to the new lid are complete per official notes.

7. Approximate length of wall demo = 12 ft

8. Approximate length for bidding purposes = 40'-0"
NOTES:

1. PROVIDE REINFORCING LAP SPLICES AND EMBEDMENT DEVELOPMENT AS SHOWN ON DETAILS. FOR ADDITIONAL INFORMATION NOT SHOWN REFER TO

2. ALL SPLICES ARE ‘LTS’ UNLESS NOTED OTHERWISE

3. PROVIDE REINFORCING EPOXY EMBEDMENT NO SCALE

4. PROVIDE AND REPLACE TUNNEL LID AS SHOWN. FOR ADDITIONAL INFORMATION AND SPECIFICATIONS REFER TO THE MANUFACTURE WRITTEN RECOMMENDATIONS.

5. APPLY BITUTHENE SYSTEM 4000 WATER PROOFING MEMBRANE MANUFACTURED BY GRACE TO THE TOP OF THE NEW TUNNEL LID IN ACCORDANCE WITH THE MANUFACTURES INSTRUCTIONS AND WRITTEN RECOMMENDATIONS.

6. REPLACE AND COMPACT NATIVE SOIL OVER COMPLETED TUNNEL REPAIR. PROVIDE SHORING WITHIN TUNNEL AS NEEDED DURING COMPACTION EFFORTS.

7. REPLACE PAVING WHERE PREVIOUSLY DISTURBED; COLOR, FINISH, AND THICKNESS TO MATCH ORIGINAL SURFACE, UNLESS NOTED OTHERWISE ON PLANS.

GENERAL NOTES:

1. SCHEDULED LAP LENGTHS ASSUME:
   a. NEED TO CONSIDER SOME ADJUSTMENTS TO GIVEN LAP LENGTHS.
   b. COORDINATE LOCATIONS OF LIVE LOADS AND REBAR WITH THE SCHEDULED LAP LENGTHS TO DETERMINE IF ADJUSTMENTS ARE REQUIRED.
   c. IF REBAR IS TO BE BURIED UNDER THE SOIL, PROVIDE SHORING AND BASE PLACEMENT AS NEEDED.

2. ALL SPLICES ARE ‘LTS’ UNLESS NOTED OTHERWISE

3. PROVIDE REINFORCING EPOXY EMBEDMENT NO SCALE

ADJUSTMENTS TO LAP LENGTHS:

1. DO NOT PROVIDE ADDITIONAL REINFORCING LAPS BEYOND THE OPENING BEYOND THE TUNNEL WALL.
2. CLEAR SPACING BETWEEN BARS IS GREATER THAN 2 BAR DIAMETERS.
3. IF EITHER CONDITION A OR B IS NOT MET FOR A GIVEN BAR, INCREASE LENGTHS BY 50%.

EMBEDMENT -

NOTES:

1. PROVIDE REINFORCING EPOXY EMBEDMENT DEVELOPMENT AS SHOWN ON DETAILS.

CONCRETE REINFORCING EPOXY EMBEDMENT SCHEDULE (INCHES)

EMBEDMENT -

NOTES:

1. PROVIDE REINFORCING LAP SPLICES AND EMBEDMENT DEVELOPMENT AS SHOWN ON DETAILS.

CONCRETE REINFORCING LAP SPOICE AND DEVELOPMENT LENGTH SCHEDULE (INCHES)
WHERE A NEW TUNNEL LID IS CONSTRUCTED ABOVE A STEAM ANCHOR SUPPORT RACK, INSTALL AN EMBED PLATE PER S4.4

WHERE NEW RACKS (BY OTHERS) HAVE BEEN INSTALLED TO SUPPORT STEAM ANCHORS UNDER EXISTING TUNNEL LIDS, INSTALL A POST INSTALLED ANCHOR CONNECTION PLATE PER S4.4

NOTE: THE EMBED PLATE SHALL BE INSTALLED CENTERED OVER THE STEAM ANCHOR UTILITY RACK. FINAL CONNECTION TO THE EMBED PLATE BY OTHERS

TYP RACK EXTENSION

EMBED PL AT NEW STEAM ANCHORS

NOT USED

TYP RACK TO EMBED PLATE CONN

POST INSTALLED STEAM ANCHOR CONNECTION PLATE

STEAM ANCHOR SUPPORT FRAME

ADD ALT #2 TUNNEL LID AND SIDEWALK SECTION

ANGLE SPLICE

11

8

4

3/8" = 1'-0"

5/8" = 1'-0"

3" = 1'-0"

2" = 1'-0"

1/2" = 1'-0"

1/4" = 1'-0"

1/16" = 1'-0"

1/32" = 1'-0"

1" = 1'-0"

3" = 1'-0"

3/8" = 1'-0"

3/16" = 1'-0"

5/32" = 1'-0"

7/32" = 1'-0"

1/8" = 1'-0"

3/16" = 1'-0"

3/32" = 1'-0"

1/32" = 1'-0"

1/16" = 1'-0"
NOTES:
1. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION
2. SPLICE #4 BARS AS NEEDED

1' - 0" 6" MIN 1' - 6"
#4@12"

(2) #4 BOT

6" MIN

TYP 3" CLR

EQUAL TREAD LENGTH
EQUAL RISER HEIGHTS

ROUGHEN SURFACE.
CLEAN & PRIME FOR PROPER BONDING

TYPICAL 3/8"x3/8" WIDE BOND BREAKER TYPICAL
TUNNEL LID CONCRETE STAIR RISER OR WALL

1" MIN

LEAVE SURFACE OF (N) TUNNEL LID ROUGHENED TO A 1/4" AMPLITUDE

#4 @ 12" OC

INSTALL COVE JOINT SEALANT PER S4.5
FOR TUNNEL LID REINF SEE S4.2
FOR STAIR REINF SEE S4.5

INSTALL BACKER ROD OR BOND BREAKER.

EXISTING CRACK OR CONTROL JOINT
EXISTING CONCRETE ROUT AS REQUIRED

KEEP JOINTS AND JOINT PASTES COMPLETELY DRY AND PROTECTED UNTIL COMPLETION OF WORK.

PROTECT JOINTS OR JOINT PASTES FROM EXPOSURE TO IRRIGATING WATER.

POURED SURFACE POLYURETHANE SEALANT TYPICAL

CONCRETE STAIR REINF.

POLYURETHANE SEALANT TYPICAL

SEALANT FLUSH WITH ADJACENT CONCRETE SURFACES

STRIKE SEALANT FLUSH WITH ADJACENT CONCRETE SURFACES

MANUFACTURER'S REPRESENTATIVE TO PROVIDE CONTRACTOR WITH ON SITE ASSISTANCE AND RECOMMENDATIONS

NOTES:
1. PROVIDE TOOLED JT OR SAW CUT AS SOON AS THE CONC HAS HARDENED SUFFICIENTLY TO PERMIT CUTTING WITHOUT CHIPPING, SPALLING, OR TEARING (BUT NOT MORE THAN 12 HOURS AFTER CASTING) REFER TO PLANS FOR JOINT LOCATIONS
2. PREPARED/COMPACTED SUBGRADE, SEE EARTHWORK SPEC

TRANSLATION & SUBGRADE

CONCRETE STAIR REINF.

POLYURETHANE SEALANT. SEE NOTES BELOW

BACKER ROD OR BOND BREAKER.

DESIGNERS:
BEN BROMIEL
DAN EAGAN
BEN NELSON

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