# BOULDER COUNTY TRANSPORTATION DEPARTMENT
# ENGINEERING DIVISION

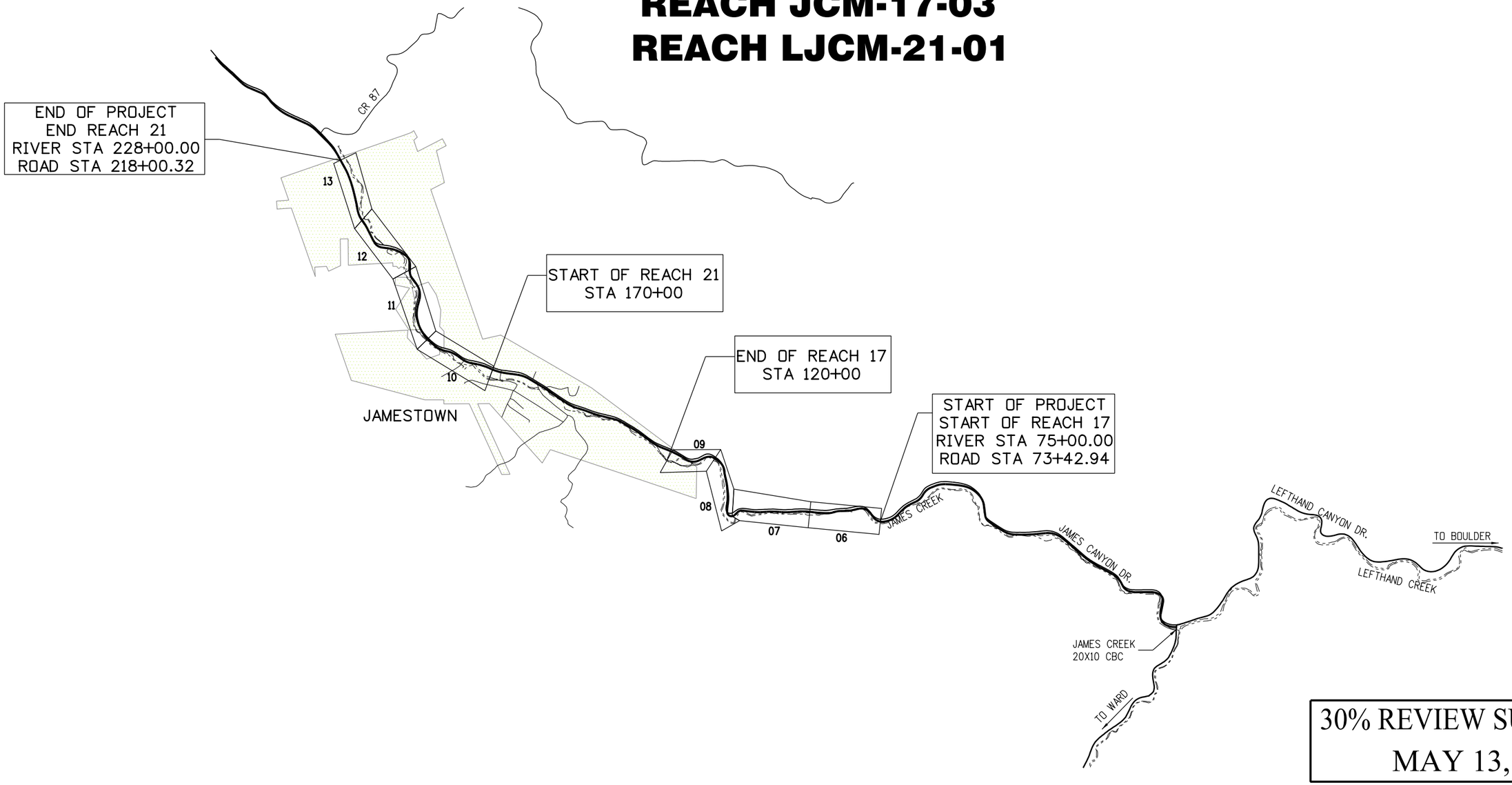
# JAMES CANYON DR.
# STREAM STABILIZATION
# REACH JCM-17-03
# REACH LJCM-21-01

## SCOPE OF WORK

THIS PROJECT CONSISTS OF STABILIZATION OF JAMES CREEK WHERE IT WAS DAMAGED BY THE SEPT 2013 FLOODING. THE PROJECT IS APPROXIMATELY 12,375 FEET IN LENGTH.

**INDEX OF SHEETS**


| SHEET NO. | INDEX OF SHEETS |
|---|---|
| 1 | SHEET INDEX |
| 2 - 6 | PLANTING DETAILS |
| 6 - 8 | STREAM DETAILS |
| 10 | TYPICAL RIFFLE SECTIONS |
| 11 - 18 | PLAN AND PROFILE |
| 19 - 35 | STREAM DETAIL GRADING |


**30% REVIEW SUBMITTAL**
**MAY 13, 2016**

0' 1000' 2000' 4000'

N

30%

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| MTC | MTC | TPF | 05/13/2016 |

JAMES CANYON
SHEET INDEX

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 1

marroquinl 5/13/2016 4:45:24 PM L:\0048\900-CAD\02-SHEETS\G\BOCD-James_Stream-TitleSheet.dgn

# GENERAL PLANTING NOTES

1. ALL NATURAL FLOODPLAIN AREAS (INCLUDING THOSE NOT DISTURBED BY RESTORATION ACTIVITIES) WILL BE HAND-SEEDED WITH THE RIPARIAN SEED MIX AT APPROXIMATELY 25.0 POUNDS OF PURE LIVE SEED PER ACRE, INCLUDING RICE HULLS FOR BULK. SEEDING WILL ONLY BE PERFORMED BETWEEN SEPTEMBER 1 AND WHEN THE GROUND FREEZES AND WHEN THE GROUND THAWS AND JUNE 1, UNLESS APPROVED BY A QUALIFIED ECOLOGIST.
2. AFTER SEEDING, ALL PORTIONS OF ZONE B AND C DISTURBED BY RESTORATION ACTIVITIES WILL BE HAND-MULCHED USING EXCELSIOR (SPUN ASPEN WOOD) MULCH APPLIED AT APPROXIMATELY 1,800 POUNDS PER ACRE (APPROXIMATELY 30 BALES AT 60 POUNDS EACH). ALTHOUGH FLOODPLAIN AREAS NOT DISTURBED BY RESTORATION ACTIVITIES WILL BE SEEDED, ONLY THOSE DISTURBED WILL BE MULCHED.
3. THE EXACT INSTALLATION LOCATION OF LIVE PLANT MATERIAL WILL BE BASED ON THE FINAL GRADING, AS DETERMINED BY A QUALIFIED ECOLOGIST.
4. ALL AREAS DISTURBED BY RESTORATION ACTIVITIES, INCLUDING THE SOIL LIFTS, WILL BE AMENDED WITH 300 CUBIC YARDS PER ACRE OF COMPOST. THE COMPOST WILL BE MIXED WITH NATIVE SOIL/ALLUVIUM TO A DEPTH OF 12 INCHES. THE COMPOST WILL HAVE THE FOLLOWING CHARACTERISTICS:
   - PH:5.5-8.0
   - MOISTURE CONTENT: 35-55 PERCENT
   - PARTICLE SIZE: PASS THROUGH 1-INCH SCREEN OR SMALLER
   - STABILITY: STABLE TO HIGHLY STABLE, PROVIDING NUTRIENTS FOR PLANT GROWTH
   - MATURITY/GROWTH SCREENING: DEMONSTRATE ABILITY TO ENHANCE PLANT GROWTH
   - SOLUBLE SALT CONCENTRATION: 2.5DS (MMHOS/CM) OR LESS PREFERRED
   - ORGANIC MATTER CONTENT: 30-70 PERCENT
   - SUGGESTED COMPOST SOURCE: A-1 ORGANIC, EATON, COLORADO 970-454-3492 OR AN APPROVED EQUAL
5. ALL WILLOW AND COTTONWOOD CUTTINGS WILL BE COLLECTED ON OR NEAR THE SITE (WITHIN 1,000 VERTICAL FEET) WHENEVER POSSIBLE, AS DIRECTED BY A QUALIFIED ECOLOGIST. ALL CUTTINGS WILL BE HARVESTED WHEN DORMANT (BEFORE LEAVES EMERGE OR AFTER THEY ARE DROPPED) FROM LIVE PLANTS 0.5 TO 1.0 INCH IN DIAMETER. THE STEM WILL BE STRIPPED OF ALL BRANCHES BEFORE CUTTING AND THEN TRIMMED TO THE DESIRED LENGTH. THE LOWER (ROOTING) END OF THE STEM WILL BE CUT AT A 45 DEGREE ANGLE AND THE UPPER END WILL BE CUT AT 90 DEGREE ANGLE. THE CUTTINGS WILL BE PLACED INTO WATER WITHIN TWO MINUTES OF CUTTING AND SOAKED--COMPLETELY SUBMERGED--FOR AT LEAST 72 HOURS, BUT NOT MORE THAN 14 DAYS, PRIOR TO PLANTING. THE CUTTINGS WILL BE KEPT WET UNTIL PLACED INTO THE GROUND AND WILL NOT BE ALLOWED OUT OF WATER FOR MORE THAN 10 MINUTES DURING PLANTING. ALL CUTTINGS WILL BE TRIMMED AFTER INSTALLATION TO ENSURE THAT NO MORE THAN ONE-THIRD OF THEIR LENGTH IS LEFT ABOVE GROUND.
6. ALL CONTAINERIZED PLANTS WILL BE INSPECTED BY A QUALIFIED ECOLOGIST PRIOR TO PLANTING. ANY DEAD, DYING, STRESSED, OR BADLY "ROOTBOUND" PLANTS WILL BE REJECTED.
7. A QUALIFIED ECOLOGIST WILL DIRECT AND SUPERVISE ALL PLANTINGS.
8. IN AN ATTEMPT TO AVOID THE CONTINUED SPREADING OF NOXIOUS WEEDS, ALL DISCRETE POPULATIONS OF COLORADO LIST A OR B NOXIOUS WEEDS FOUND IN OR WITHIN 100 FEET OF THE RESTORATION AREA WILL BE SPRAYED WITH THE APPROPRIATE HERBICIDE(S) PRIOR TO CONSTRUCTION IN COORDINATION WITH THE BOULDER COUNTY WEED COORDINATOR.
9. ALL FINISHED GRADES WILL BE LEFT ROUGH AND NATURAL WITH NO SMOOTH SURFACES, STRAIGHT EDGES, OR RIGHT ANGLES.
10. ALL WORK AREAS (OTHER THAN THE IMMEDIATE CHANNEL BANKS) WILL BE LOOSENED TO A DEPTH OF 12 INCHES BEFORE PLANTING AND SEEDING.
11. NO EQUIPMENT WILL BE ALLOWED IN THE RESTORATION AREA AFTER SEEDING OR PLANTING.
12. ANY TREES TO BE REMOVED FOR THE PROJECT WILL BE REMOVED DURING THE NON-NESTING SEASON FOR MIGRATORY BIRDS (BEFORE SEPTEMBER 1 AND MARCH 31). IF THIS IS NOT POSSIBLE, ACTIVE NEST SURVEYS FOR MIGRATORY BIRDS MAY BE REQUIRED.
13. ALL BEST MANAGEMENT PRACTICES (BMPS) USED SHALL BE SELECTED, INSTALLED, IMPLEMENTED, AND MAINTAINED ACCORDING TO APPROPRIATE ENGINEERING, HYDROLOGIC AND POLLUTION CONTROL PRACTICES.
14. THE USE OF CHEMICALS SUCH AS SOIL STABILIZERS, DUST PALLIATIVES, HERBICIDES, GROWTH INHIBITORS, FERTILIZERS, DEICING SALTS, ETC., SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED APPLICATION RATES, FREQUENCY, AND INSTRUCTIONS. THESE CHEMICALS SHALL NOT BE USED, STORED, OR STOCKPILED WITHIN 50 HORIZONTAL FEET OF THE CREEK OR OTHER AQUATIC HABITATS.
15. CONSTRUCTION EQUIPMENT, FUELS, LUBRICANTS, AND OTHER PETROLEUM DISTILLATES SHALL NOT BE STORED OR STOCKPILED WITHIN 50 HORIZONTAL FEET OF THE CREEK OR OTHER AQUATIC HABITATS. EQUIPMENT FUELING AND SERVICING SHALL OCCUR ONLY WITHIN APPROVED DESIGNATED AREAS.
16. IF EXISTING RIPARIAN VEGETATION IS PRESENT BUT TOO HIGH ABOUVE THE LOW-FLOW CHANNEL TO BE WETTED THROUGH CAPILLARY ACTION (BECASUE OF CHANNEL DEGRADATION ASSOCIATED WITH THE FLOOD), WHENEVER POSSIBLE THE BANKS WILL BE LAID BACK AND THE EXISTING VEGETATION WILL BE MOVED (TRANSPLANTED) TO THE APPROPRIATE ELEVATION ABOVE THE WATER SURFACE OF THE LOW-FLOW CHANNEL; 0 TO 1 FOOT ABOVE FOR HERBACEOUS WETLAND VEGETATION AND 1 TO 3 FEET FOR WETLAND/RIPARIAN WOODY VEGETATION.

| RIPARIAN SEED MIX[1] | | | | | | |
|---|---|---|---|---|---|---|
| TYPE | COMMON NAME | SCIENTIFIC NAME | VARIETY[2] | SEEDS PER POUND[2] | SEEDS PER SQUARE FOOT | POUNDS OF PURE LIVE SEED/ACRE |
| GRAMINOIDS | INDIAN RICEGRASS | ACNATHERUM HYMENOIDES | PALOMA | 141,000 | 3.9 | 1.2 |
| | SIDEOATS GRAMA | BOUTELOUA CURTIPENDULA | BUTTE OR PIERRE | 191,000 | 5.3 | 1.2 |
| | BLUE GRAMA[3] | BOUTELOUA GRACILIS[3] | BIRDS EYE, ALMA, OR LOVINGTON | 825,000 | 11.4 | 0.6 |
| | SLENDER WHEATGRASS | ELYMUS TRACHYCAULUS | WHITE RIVER OR SAN LUIS | 159,000 | 4.4 | 1.2 |
| | IDAHO FESCUE[3] | FESTUCA IDAHOENSIS[3] | WINCHESTER | 450,000 | 8.3 | 0.8 |
| | FOWL MANNAGRASS | GLYCERIA STRIATA | - | 180,000 | 8.3 | 2 |
| | NEEDLE AND THREAD | HESPEROSTIPA COMATA | - | 115,000 | 5.3 | 2 |
| | PRAIRIE JUNEGRASS[3] | KOELERIA MACRANTHA[3] | - | 2.3 MILLION | 5.3 | 0.1 |
| | BALTIC RUSH[3] | JUNCUS BALTICUS[3] | - | 10.9 MILLION | 25 | 0.1 |
| | TORREY'S RUSH[3] | JUNCUS TORREYI[3] | - | 12.3 MILLION | 28.2 | 0.1 |
| | GREEN NEEDLEGRASS | NASSELLA VIRIDULA | CUCHARAS OR LODORM | 181,000 | 4.2 | 1 |
| | WESTERN WHEATGRASS | PASCOPYRUM SMITHII | ARRIBA | 110,000 | 10.1 | 4 |
| | FOWL BLUEGRASS[3] | POA PALUSTRIS[3] | - | 3.2 MILLION | 7.3 | 0.1 |
| | SANDBERG BLUEGRASS[3] | POA SECUNDA[3] | SIMS MESA OR HIGH PLAINS | 1 MILLION | 6.9 | 0.3 |
| | BLUEBUNCH WHEATGRASS | PSEUDOROEGNERIA SPICATA | P7 | 140,000 | 6.4 | 2 |
| | LITTLE BLUESTEM | SCHIZACHYRIUM SCOPARIUM | PASTURA, CIMARRON, OR CAMPER | 260,000 | 6 | 1 |
| | PRAIRIE CORDGRASS | SPARTINA PECTINATA | - | 197,000 | 4.5 | 1 |
| FORBS | COMMON YARROW[3] | ACHILLEA MILLEFOLIUM[3] | - | 2.7 MILLION | 6.2 | 0.1 |
| | ROCKY MOUNTAIN BEE PLANT | CLEOME SERRULATA | - | 66,000 | 3 | 2 |
| | GOLDEN TICKSEED[3] | COREOPSIS TINCTORIA[3] | - | 1.4 MILLION | 3.2 | 0.1 |
| | BLANKETFLOWER | GAILLARDIA ARISTATA | MERIWEATHER | 132,000 | 1.5 | 0.5 |
| | SHOWY GOLDENEYE[3] | HELIOMERIS MULTIFLORA[3] | - | 1 MILLION | 2.3 | 0.1 |
| | ROCKY MOUNTAIN PENSTEMON | PENSTEMON STRICTUS | BANDERA | 490,000 | 2.2 | 0.2 |
| | AMERICAN VETCH | VICIA AMERICANA | - | 33,000 | 0.8 | 1 |
| BULK | RICE HULLS | - | - | - | - | 2.3 |
| | | | | TOTAL | 170 | 25 |

[1]NOMENCLAUTRE FOLLOWS PLANTS DATABASE (NRCS 2016); SEEDING RATE BASED ON HAND-BROADCASTING; ANY SUBSTITUTIONS MUST BE NATIVE TO COLORADO AND FROM A US OR CANADA SEED SOURCE.

[2]SOURCES: NRCS 2016, GRANITE SEED 2016, WESTERN NATIVE SEED 2016, NSN 2016

[3]BAG SEPARATELY IF USING A MECHANICAL BROADCASTER

30% REVIEW SET

AlpineEco

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

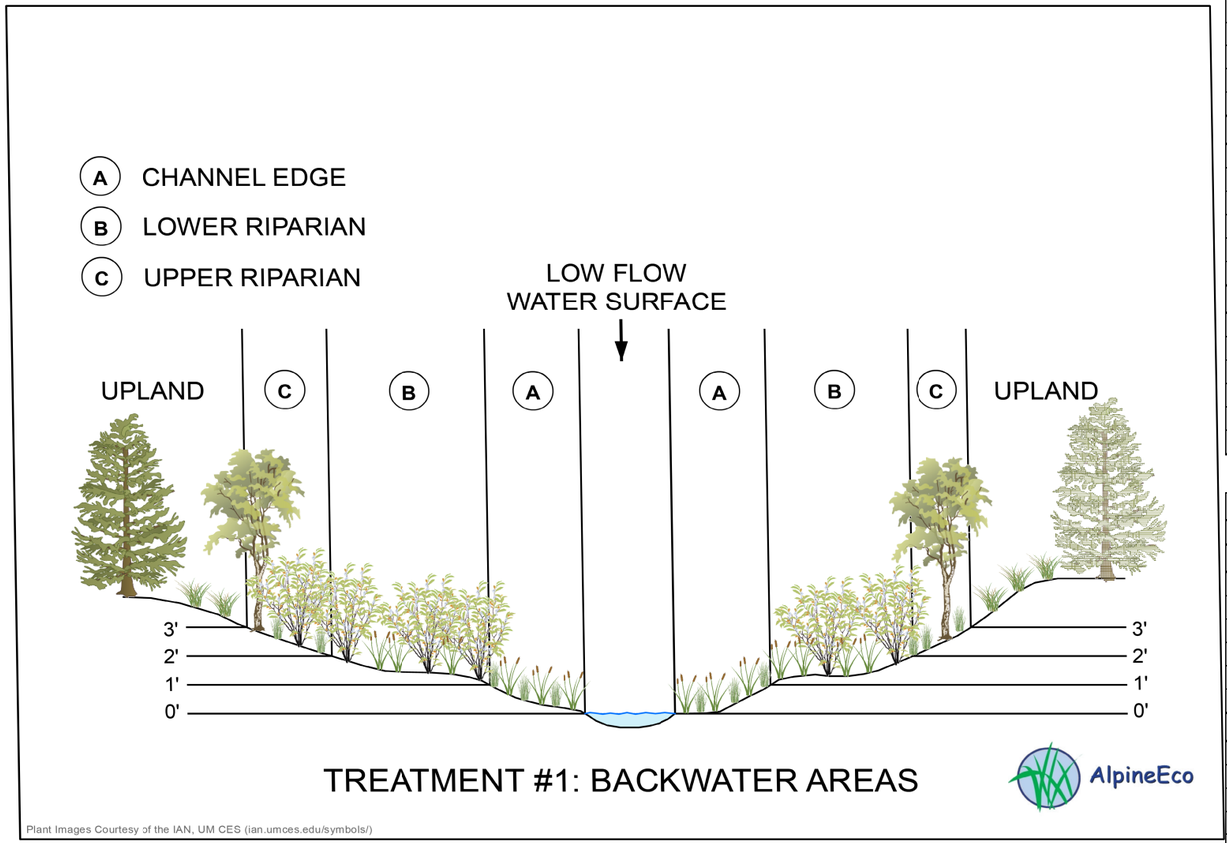
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
PLANTING DETAILS
(1 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 2

marroquinl 3:41:03 PM L:\00481.900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_PLDET01.dgn




| REACH 17: TABULATION OF PLANTINGS: TREATMENT 1[1] BACKWATER AREAS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER ACRE | ACRE | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| BLUEJOINT | CALAMAGROSTIS CANADENSIS | 10 | 750 | 0.49 | 368 |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 1,500 | 0.49 | 735 |
| WOLLY SEDGE | CAREX PELLITA | 10 | 1,000 | 0.49 | 490 |
| CREEPING SPIKERUSH | ELEOCHARIS PALUSTRIS | 10 | 1,000 | 0.49 | 490 |
| BALTIC RUSH | JUNCUS BALTICUS | 10 | 1,000 | 0.49 | 490 |
| RED-TINGE BULRUSH | SCIRPUS MICROCARPUS | 10 | 750 | 0.49 | 368 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| THINLEAF ALDER | ALNUS INCANA | 40 | 1,000 | 0.92 | 920 |
| WATER BIRCH | BETULA OCCIDENTALIS | 40 | 750 | 0.92 | 690 |
| REDOSIER DOGWOOD | CORNUS ALBA | 40 | 750 | 0.92 | 690 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 1,250 | 0.92 | 1,150 |
| NARROWLEAF WILLOW | SALIX EXIGUA | 40 | 1,500 | 0.92 | 1,380 |
| DEWYSTEM WILLOW | SALIX IRRORATA | 40 | 750 | 0.92 | 690 |
| ZONE C: UPPER RIPARIAN[4] | | | | | |
| RUBBER RABBITBRUSH | ERICAMERIA NAUSEOSUS | 40 | 200 | 0.45 | 90 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 300 | 0.45 | 135 |
| CHOKECHERRY | PRUNUS VIRGINIANA | 40 | 200 | 0.45 | 90 |
| COMMON SNOWBERRY | SYMPHORICARPOS ALBA | 40 | 200 | 0.45 | 90 |
| WHITE-STEM GOOSEBERRY | RIBES INERME | 40 | 200 | 0.45 | 90 |
| WOODS' ROSE | ROSA WOODSII | 40 | 300 | 0.45 | 135 |

| REACH 21: TABULATION OF PLANTINGS: TREATMENT 1[1] BACKWATER AREAS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER ACRE | ACRE | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| BLUEJOINT | CALAMAGROSTIS CANADENSIS | 10 | 750 | 0.50 | 375 |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 1,500 | 0.50 | 750 |
| WOLLY SEDGE | CAREX PELLITA | 10 | 1,000 | 0.50 | 500 |
| CREEPING SPIKERUSH | ELEOCHARIS PALUSTRIS | 10 | 1,000 | 0.50 | 500 |
| BALTIC RUSH | JUNCUS BALTICUS | 10 | 1,000 | 0.50 | 500 |
| RED-TINGE BULRUSH | SCIRPUS MICROCARPUS | 10 | 750 | 0.50 | 375 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| THINLEAF ALDER | ALNUS INCANA | 40 | 1,000 | 0.46 | 460 |
| WATER BIRCH | BETULA OCCIDENTALIS | 40 | 750 | 0.46 | 345 |
| REDOSIER DOGWOOD | CORNUS ALBA | 40 | 750 | 0.46 | 345 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 1,250 | 0.46 | 575 |
| NARROWLEAF WILLOW | SALIX EXIGUA | 40 | 1,500 | 0.46 | 690 |
| DEWYSTEM WILLOW | SALIX IRRORATA | 40 | 750 | 0.46 | 345 |
| ZONE C: UPPER RIPARIAN[4] | | | | | |
| RUBBER RABBITBRUSH | ERICAMERIA NAUSEOSUS | 40 | 200 | 0.84 | 168 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 300 | 0.84 | 252 |
| CHOKECHERRY | PRUNUS VIRGINIANA | 40 | 200 | 0.84 | 168 |
| COMMON SNOWBERRY | SYMPHORICARPOS ALBA | 40 | 200 | 0.84 | 168 |
| WHITE-STEM GOOSEBERRY | RIBES INERME | 40 | 200 | 0.84 | 168 |
| WOODS' ROSE | ROSA WOODSII | 40 | 300 | 0.84 | 252 |

## TREATMENT 1 : BACKWATER AREAS

1. THE BACKWATER AREAS INCLUDE THREE PLANTING ZONES (A, B, AND C), AND SEEDING IN ALL ZONES (SEE DETAIL).
2. PLANTING ZONE A (CHANNEL EDGE) ENCOMPASES THOSE AREAS BETWEEN 0 AND 1 FOOT (VERTICAL) ABOVE THE LOW FLOW CHANNEL WATER SURFACE ELEVATION AND GENERALLY IN AREAS PROTECTED FROM SCOUR/DIRECT FLOW. ZONE B (LOWER RIPARIAN) INCLUDES THOSE AREAS BETWEEN 1 AND 2 FEET ABOUVE THE LOW FLOW CHANNEL, AND ZONE C (UPPER RIPARIAN) INCLUDES THOSE AREAS BETWEEN 2 AND 3 FEET ABOVE.
3. ALL BACKWATER AREAS WILL BE HAND-SEEDED WITH THE RIPARIAN SEED MIX AT APPROXIMATELY 25.0 POUNDS OF PURE LIVE SEED PER ACRE, INCLUDING 2.3 POUNDS OF RICE HULLS FOR BULK.
4. ALL PORTIONS OF ZONES B AND C WHERE EARTHWORK OCCURS WILL BE HAND-MULCHED WITH EXCELSIOR (SPUN ASPEN WOOD) AT A RATE OF APPROXIMATELY 1,800 POUNDS PER ACRE (APPROXIMATELY 30 BALES AT 60 POUNDS EACH).

[1]ZONE A IS 0-1', ZONE B IS 1-2', AND ZONE C IS 2-3' ABOVE THE LOW-FLOW WATER SURFACE ELEVATION; EXACT PLANTING LOCATIONS WILL BE BASED ON FINAL GRADING AND DIRECTED BY A QUALIFIED ECOLOGIST; PLANT NOMENCLATURE FROM NATIONAL WETLAND PLANT LIST

[2]BASED ON APPROXIMATELY 3-FOOT CENTERS

[3]BASED ON APPROXIMATELY 6-FOOT CENTERS

**30% REVIEW SET**

AlpineEco

30%

811 CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

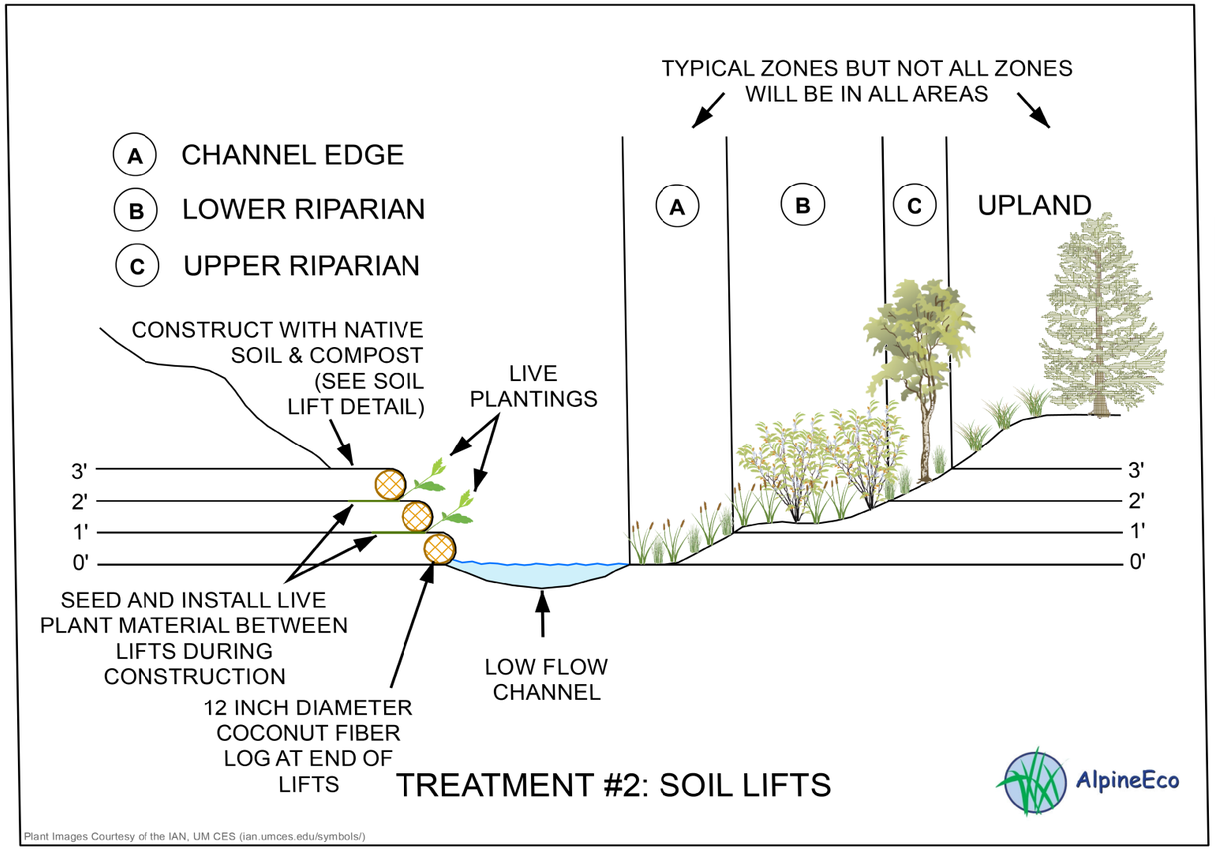
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
PLANTING DETAILS
(2 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 3

marroquinl 3:41:18 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_PLDET02.dgn




| REACH 17: TABULATION OF PLANTINGS: TREATMENT 2[1] SOIL LIFTS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER LINEAR FOOT | LF | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 3 | 2,743 | 8,229 |
| WOLLY SEDGE | CAREX PELLITA | 10 | 3 | 2,743 | 8,229 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 6 | 2,807 | 16,842 |

| REACH 21: TABULATION OF PLANTINGS: TREATMENT 2[1] SOIL LIFTS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER LINEAR FOOT | LF | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 3 | 6,065 | 18,195 |
| WOLLY SEDGE | CAREX PELLITA | 10 | 3 | 6,065 | 18,195 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 6 | 6,065 | 36,390 |

[1] PLANT NOMENCLATURE FROM NATIONAL WETLAND PLANT LIST

[2] ZONE A PLANTS ONLY PLACED BETWEEN LIFTS THAT ARE WITHIN 1 FOOT (VERTICAL) OF THE LOW-FLOW WATER SURFACE ELEVATION; SPECIES NOT MIXED, A MINIMUM OF 16 LINEAR FEET OF EACH SPECIES

[3] ZONE B PLANTS ONLY PLACED BETWEEN LIFTS THAT ARE 1 TO 2 FEET (VERTICAL) ABOVE THE LOW-FLOW WATER SURFACE ELEVATION

## TREATMENT 2: SOIL LIFTS

1. THIS TREATMENT INVOLVES THE INSTALLATION OF LIVE PLANT MATERIAL DURING THE CONSTRUCTION OF THE SOIL LIFTS (SEE DETAIL). CONTAINERIZED HERBACEOUS (10 CI) WILL BE PLACED IN BETWEEN LIFTS (DURING CONSTRUCTION OF THE LIFTS) WHERE THE ELEVATION IS 1 FOOT OR LESS ABOVE THE WATER SURFACE OF THE LOW-FLOW CHANNEL. WILLOW CUTTINGS (5-FOOT LONG) WILL BE INSTALLED BETWEEN THE LIFTS (DURING CONSTRUCTION) WHERE THE ELEVATION IS BETWEEN 1 AND 2 FEET ABOVE THE LOW-FLOW WATER SURFACE.
2. THE LIFTS WILL BE CONSTRUCTED WITH NATIVE SOIL MIXED WITH COMPOST (300 CUBIC YARDS/ACRE) AND THEN HAND-SEEDED WITH THE RIPARIAN MIX AT APPROXIMATELY 25.0 POUNDS OF PURE LIVE SEED PER ACRE (INCLUDING 2.3 POUNDS OF RICE HULLS FOR BULK) BEFORE WRAPPING WITH COCONUT FIBER BLANKET. SEED SHOULD BE PLACED ON THE SOIL SURFACE, JUST BENEATH THE COCONUT FIBER BLANKET.
3. A 12" DIAMETER COCONUT FIBER LOG WILL BE PLACED AT THE END OF EACH LIFT TO HELP PROTECT IT FROM EROSION.

30% REVIEW SET

marroquinl 3:45:58 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_PLDET03.dgn

AlpineEco

30%

811 CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

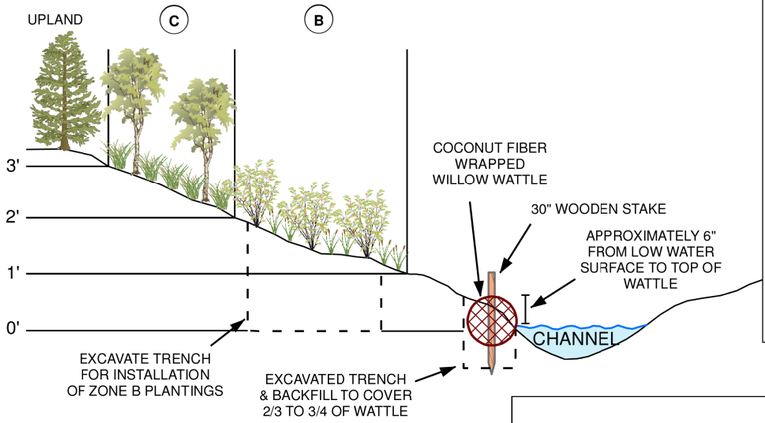
| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

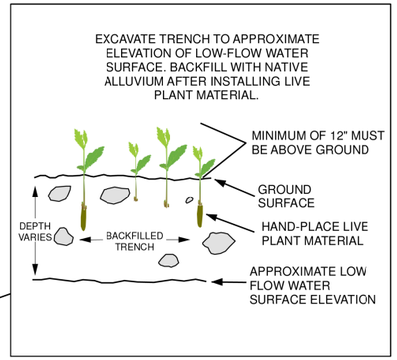
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON PLANTING DETAILS (3 OF 5)

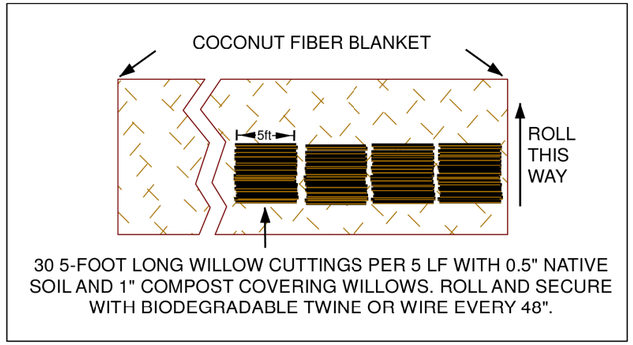
PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 4










# TREATMENT #3: WILLOW TOE PROTECTION AREAS

AlpineEco

| REACH 17: TABULATION OF PLANTINGS:TREATMENT 3[1] WILLOW TOE PROTECTION AREAS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER LINEAR FOOT | LF | TOTAL |
| WATTLE[2] | | | | | |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 6 | 1,110 | 6,660 |
| ZONE B TRENCH[3] | | | | | |
| THINLEAF ALDER | ALNUS INCANA | 40 | 0.05 | 1,110 | 56 |
| WATER BIRCH | BETULA OCCIDENTALIS | 40 | 0.05 | 1,110 | 56 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 0.05 | 1,110 | 56 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 5' CUTTING | 0.1 | 1,110 | 111 |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 0.15 | 1,110 | 167 |
| MIXED COTTONWOOD/WILLOW/ALDER | POPULUS/SALIX/ALNUS SPP. | TRANSPLANT | 0.02 | 1,110 | 22 |
| NARROWLEAF WILLOW | SALIX EXIGUA | 40 | 0.05 | 1,110 | 56 |
| DEWYSTEM WILLOW | SALIX IRRORATA | 40 | 0.05 | 1,110 | 56 |

| REACH 21: TABULATION OF PLANTINGS:TREATMENT 3[1] WILLOW TOE PROTECTION AREAS | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER LINEAR FOOT | LF | TOTAL |
| WATTLE[2] | | | | | |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 6 | 1,153 | 6,918 |
| ZONE B TRENCH[3] | | | | | |
| THINLEAF ALDER | ALNUS INCANA | 40 | 0.05 | 1,153 | 58 |
| WATER BIRCH | BETULA OCCIDENTALIS | 40 | 0.05 | 1,153 | 58 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 40 | 0.05 | 1,153 | 58 |
| NARROWLEAF COTTONWOOD | POPULUS ANGUSTIFOLIA | 5' CUTTING | 0.1 | 1,153 | 115 |
| MIXED WILLOW | SALIX SPP. | 5' CUTTING | 0.15 | 1,153 | 173 |
| MIXED COTTONWOOD/WILLOW/ALDER | POPULUS/SALIX/ALNUS SPP. | TRANSPLANT | 0.02 | 1,153 | 23 |
| NARROWLEAF WILLOW | SALIX EXIGUA | 40 | 0.05 | 1,153 | 58 |
| DEWYSTEM WILLOW | SALIX IRRORATA | 40 | 0.05 | 1,153 | 58 |

[1]PLANT NOMENCLATURE FROM NATIONAL WETLAND PLANT LIST 2016; ZONE C WILL BE PLANTED ACCORDING TO THE DENSITY SHOWN FOR THE TABULATION OF PLANTINGS: TREATMENT 1

[2]A TOTAL OF 30 WILLOW CUTTINGS WILL BE USED FOR EVERY 5 LINEAR FEET OF WATTLE. ALL PLANTS WILL BE MIXED WITH SOIL AND COMPOST, WRAPPED IN COCONUT FIBER, BUNDLED, AND INSTALLED IN A TRENCH PARALLEL TO THE CHANNEL LOCATED AT THE TOE-OF-SLOPE.

[3]ALL PLANTS WILL BE INSTALLED IN A TRENCH (EXCAVATED USING EARTHMOVING EQUIPMENT) PARALLEL TO THE CHANNEL. THE BOTTOM OF THE TRENCH WILL BE APPROXIMATELY THE ELEVATION OF THE LOW-FLOW WATER SURFACE. ALL PLANTS RANDOMLY MIXED.

## TREATMENT 3: WILLOW TOE PROTECTION AREAS

1. WILLOW TOE PROTECTION CONSISTS OF INSTALLING WILLOW "WATTLES" OR WRAPPED BUNDLES OF 5-FOOT LONG WILLOW CUTTINGS IN A TRENCH PARALLEL TO THE FLOW WHERE THE BANK MEETS THE LOW-FLOW CHANNEL (SEE DETAIL). THE WATTLES WILL BE CONSTRUCTED BY LAYING THE WILLOWS (30 CUTTINGS FOR EVERY 5 FEET OF WATTLE) IN THE CENTER OF THE 13-FOOT WIDE COCONUT FIBER BLANKET, ADDING 0.5 INCH OF NATIVE SOIL AND 1 INCH OF COMPOST, AND ROLLING ALONG THE SHORT AXIS (BLANKET WIDTH) TO CREATE THE DESIRED WATTLE LENGTH. SECURE WITH BIODEGRADABLE TWINE OR WIRE EVERY 4 FEET. THE WATTLE WILL THEN BE SECURED IN THE TRENCH WITH THE TOP OF THE WATTLE APPROXIMATELY 6 INCHES ABOVE THE LOW-FLOW WATER SURFACE ELEVATION AND STAKED EVERY 3 FEET WITH 30 INCH-LONG WOODEN STAKES. THEN, THE TRENCH WILL BE BACKFILLED AND LIGHTLY TAMPED SO THAT ⅔ TO ¾ OF THE WATTLE IS BURIED.
2. ZONE B LIVE PLANT MATERIAL (TRANSPLANTS, CONTAINERIZED STOCK, AND CUTTINGS) WILL BE INSTALLED BY USING EQUIPMENT TO EXCAVATE A TRENCH PARALLEL TO THE CHANNEL, WITH THE BOTTOM OF THE TRENCH CORRESPONDING TO THE APPROXIMATE ELEVATION OF THE LOW-FLOW CHANNEL WATER SURFACE. THE PLANT MATERIAL WILL BE PLACED INTO THE TRENCH, BACKFILLED, AND LIGHTLY TAMPED. ALL PLANTS WILL BE PLACED UPRIGHT AND SO THAT AT LEAST ½ OF THE ABOVE-GROUND PLANT MASS IS ABOVE THE NEW GROUND SURFACE.
3. ZONE A WILL NOT BE PLANTED IN THESE AREAS AND ZONE C WILL BE HAND-PLANTED AT THE SAME DENSITY SHOWN FOR BACKWATER AREAS (TREATMENT 1).
4. ALL TREATMENT AREAS WILL BE HAND-SEEDED WITH THE RIPARIAN SEED MIX AT APPROXIMATELY 25.0 POUNDS OF PURE LIVE SEED PER ACRE, INCLUDING 2.3 POUNDS OF RICE HULLS FOR BULK. THESE AREAS WILL ALSO BE HAND-MULCHED WITH EXCELSIOR (SPUN ASPEN WOOD) AT A RATE OF APPROXIMATELY 1,800 POUNDS PER ACRE (APPROXIMATELY 30 BALES AT 60 POUNDS EACH).

30% REVIEW SET

marroquinl 3:50:57 PM L:\0048\900-CAD\02-SHEETS\HV\James-Stream Stabilization\BOCO-James_PLDET04.dgn

AlpineEco

30%

811 CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Boulder County

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON PLANTING DETAILS (4 OF 5)

PROJECT NO: SEPTI2C24 SEPTI2C91 | SHEET NO: 5

## TREATMENT 4: ROOTWADS

1. THIS TREATMENT INVOLVES THE INSTALLATION OF LIVE PLANT MATERIAL DURING AND AFTER THE INSTALLATION OF ROOTWADS (SEE ROOTWAD DETAIL).
2. WILLOW CUTTINGS (3-FOOT LONG) WILL BE PLACED DURING INSTALLATION OF THE ROOTWADS IN AREAS WHERE A PORTION OF THE CUTTING IS THE ELEVATION BETWEEN 1 AND 2 FEET ABOVE THE LOW-FLOW WATER SURFACE.
3. CONTAINERIZED HERBACEOUS PLANTS (10CI) WILL BE PLACED AFTER THE ROOTWADS ARE INSTALLED IN AREAS PROTECTED FROM DIRECT FLOW/SCOUR (MAINLY ON THE DOWNSTREAM SIDE OF THE ROOTWAD) WHERE THE ELEVATION IS 1 FOOT OR LESS ABOVE THE LOW-FLOW WATER SURFACE.

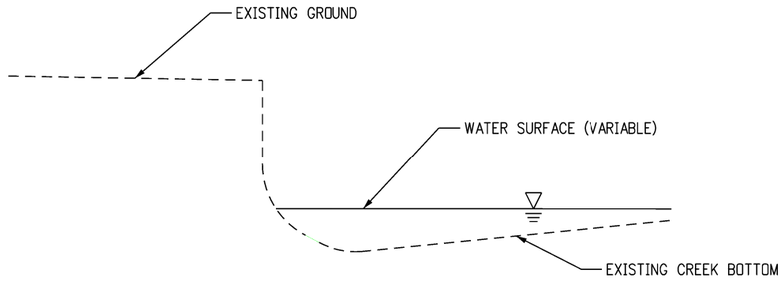
| REACH 17: TABULATION OF ROOTWADS: TREATMENT 4[1] | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER ROOTWAD | ROOTWADS | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| BLUEJOINT | CALAMAGROSTIS CANADENSIS | 10 | 4 | 3 | 12 |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 10 | 3 | 30 |
| WOOLLY SEDGE | CAREX PELLITA | 10 | 10 | 3 | 30 |
| CREEPING SPIKERUSH | ELEOCHARIS PALUSTRIS | 10 | 10 | 3 | 30 |
| BALTIC RUSH | JUNCUS BALTICUS | 10 | 10 | 3 | 30 |
| RED-TINGE BULRUSH | SCIRPUS MICROCARPUS | 10 | 5 | 3 | 15 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| MIXED WILLOW | SALIX SPP. | 3' CUTTING | 25 | 3 | 75 |

[1]PLANT NOMENCLATURE FROM NATIONAL WETLAND PLANT LIST

| REACH 21: TABULATION OF ROOTWADS: TREATMENT 4[1] | | | | | |
|---|---|---|---|---|---|
| COMMON NAME | SCIENTIFIC NAME | PLANT SIZE (CUBIC INCH) | PLANTS PER ROOTWAD | ROOTWADS | TOTAL |
| ZONE A: CHANNEL EDGE[2] | | | | | |
| BLUEJOINT | CALAMAGROSTIS CANADENSIS | 10 | 4 | 0 | 0 |
| NEBRASKA SEDGE | CAREX NEBRASCENSIS | 10 | 10 | 0 | 0 |
| WOOLLY SEDGE | CAREX PELLITA | 10 | 10 | 0 | 0 |
| CREEPING SPIKERUSH | ELEOCHARIS PALUSTRIS | 10 | 10 | 0 | 0 |
| BALTIC RUSH | JUNCUS BALTICUS | 10 | 10 | 0 | 0 |
| RED-TINGE BULRUSH | SCIRPUS MICROCARPUS | 10 | 5 | 0 | 0 |
| ZONE B: LOWER RIPARIAN[3] | | | | | |
| MIXED WILLOW | SALIX SPP. | 3' CUTTING | 25 | 0 | 0 |

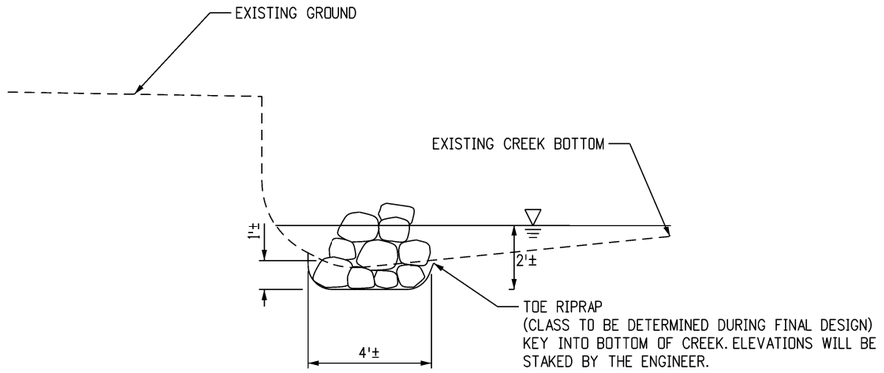
[1]PLANT NOMENCLATURE FROM NATIONAL WETLAND PLANT LIST

30% REVIEW SET



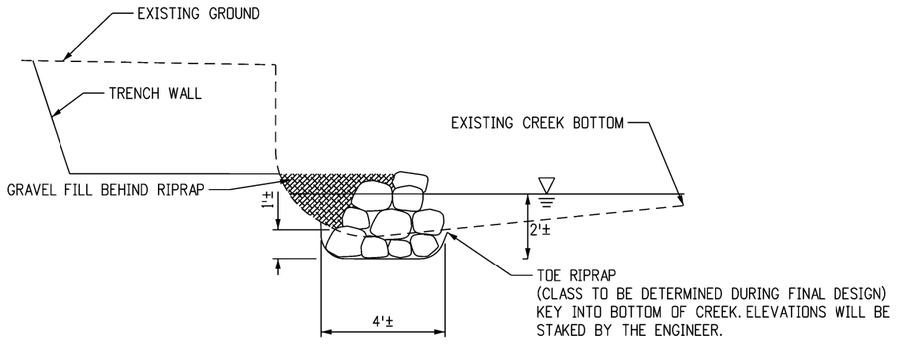

## ROOTWAD INSTALLATION

EXISTING CONDITION



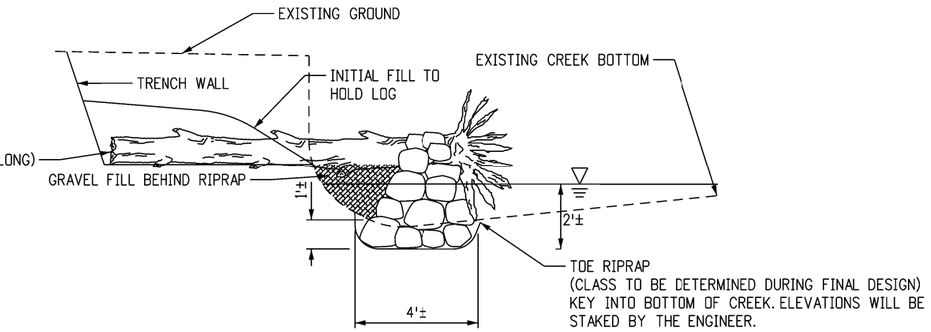

## STEP 1

PLACE TOE RIPRAP



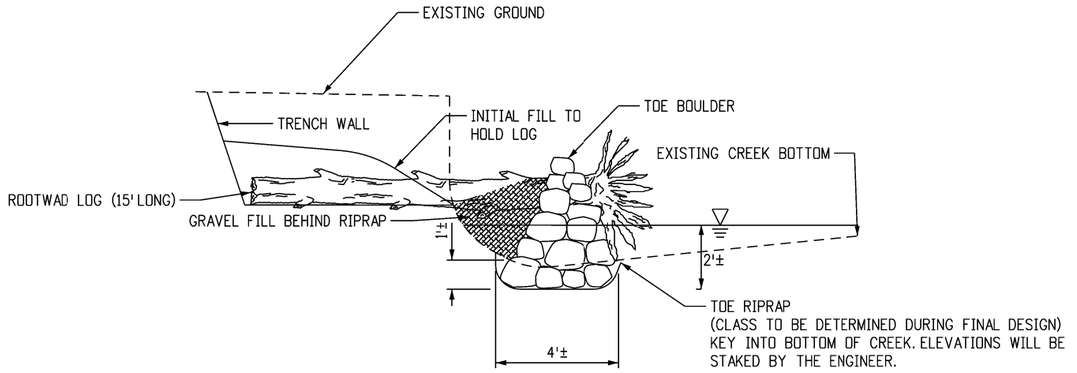

## STEP 2

PLACE GRAVEL BEHIND TOE RIPRAP AND EXCAVATE TRENCH FOR ROOTWAD LOG



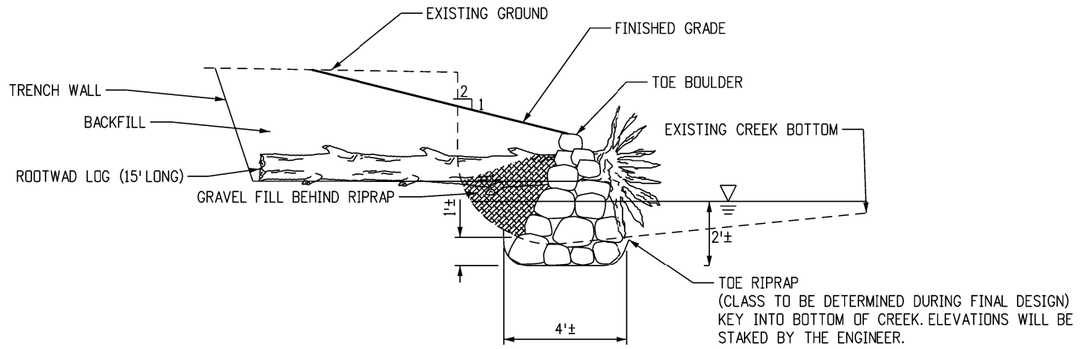

## STEP 3

PLACE ROOTWAD AND INITIAL FILL OVER LOG




## STEP 4

ADD RIPRAP AND GRAVEL TO TOP OF ROOTWAD LOG, PLACE TOE BOULDER ON TOP




## STEP 5

PLACE REMAINING FILL, SHAPE BANK AND VEGETATE

NOTE: PLACE EROSION CONTROL BLANKET ON THE 2:1 SLOPE
BACKFILL WILL BE ADEQUATE TO COUNTER THE LOGS BOUYANCY

**30% REVIEW SET**

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

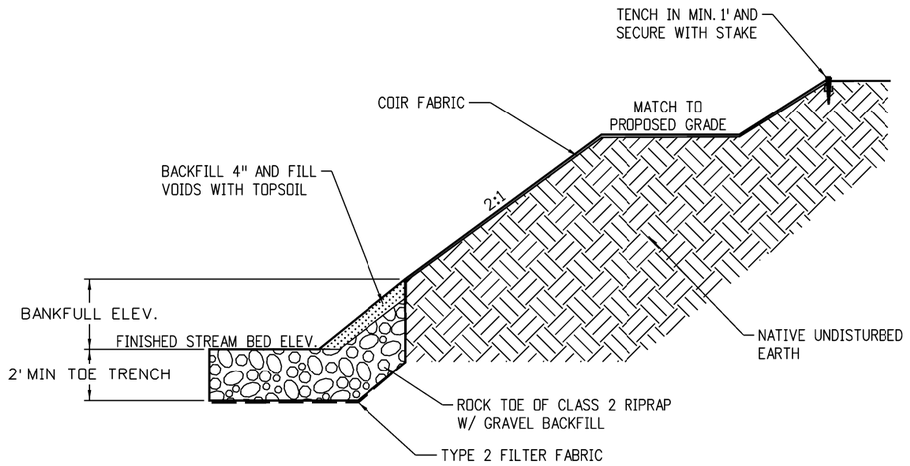
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| MTC | MTC | TPF | 05/13/2016 |

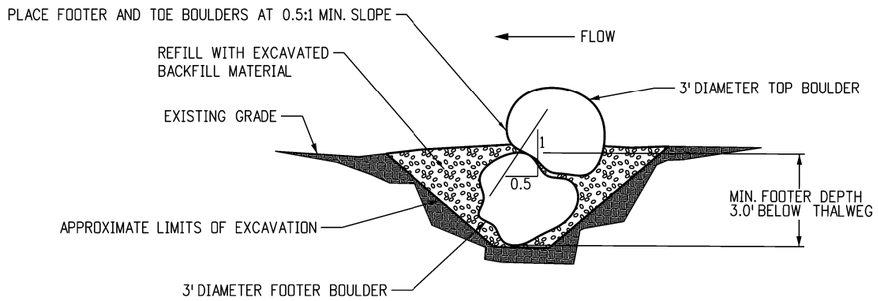
JAMES CANYON STREAM DETAILS (1 OF 3)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 7

marroquinl 3:52:06 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STDET01.dgn

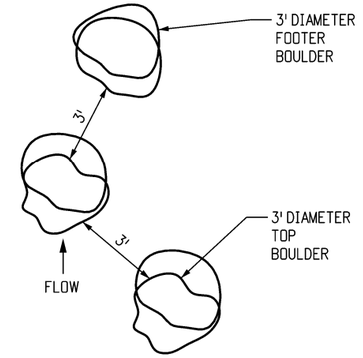



## ROCK TOE
SCALE: NTS




## BOULDER CLUSTER DETAIL

NOTE: OFFSET FOOTER BOULDER IN THE DOWNSTREAM DIRECTION, PERPENDICULAR TO FLOW



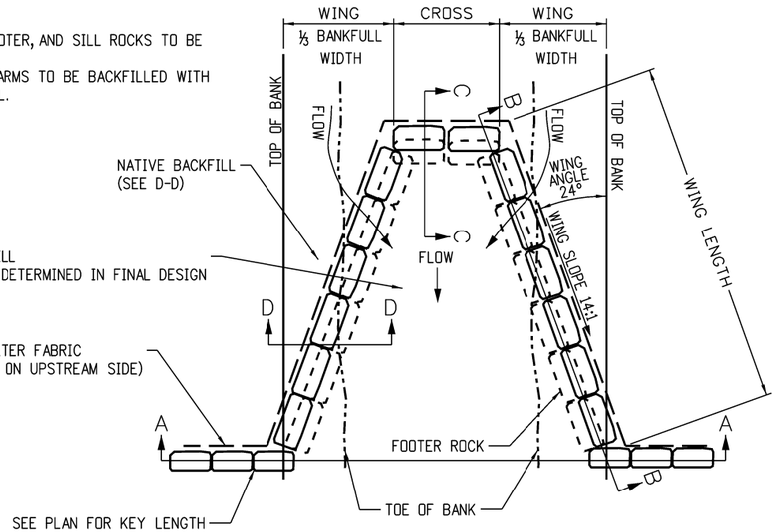

## BOULDER CLUSTER PLAN VIEW DETAIL

NOTE: SPACE BOULDERS A MINIMUM OF 1 BOULDER WIDTH IN DIAMOND OR TRIANGLE PATTERN. OFFSET BOULDERS FROM FLOWLINE.

## TYPICAL BOULDER CLUSTER
SCALE: NTS

NOTES:

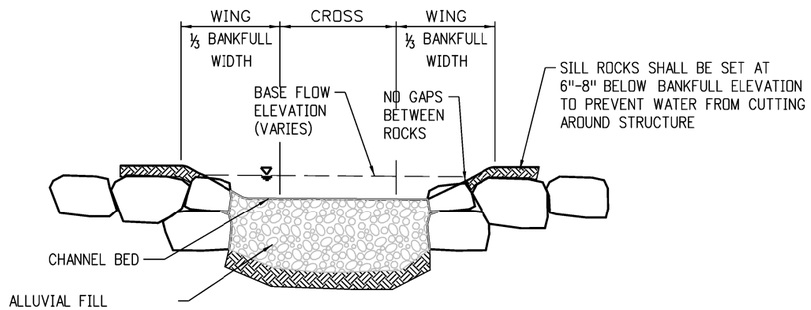
1. HEADER, FOOTER, AND SILL ROCKS TO BE BOULDERS.
2. ALL VANE ARMS TO BE BACKFILLED WITH NATIVE FILL.



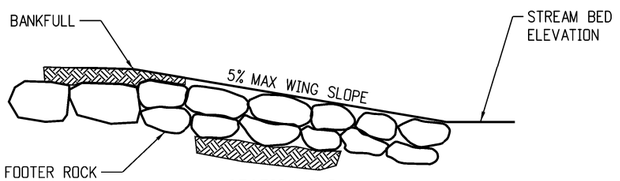

## PLAN VIEW

| FOOTER AND HEADER BOULDER DIMENSIONS | | |
|---|---|---|
| MINIMUM | MIDRANGE | MAXIMUM |
| XX" | XX" | XX" |

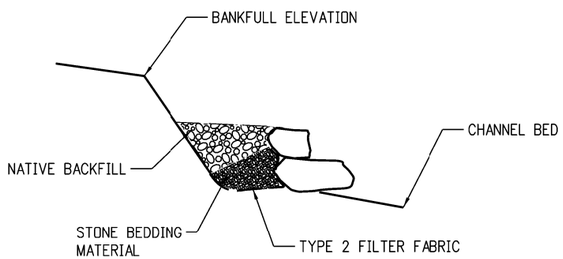
**BOULDER DIMENSIONS TO BE DETERMINED DURING FINAL DESIGN**



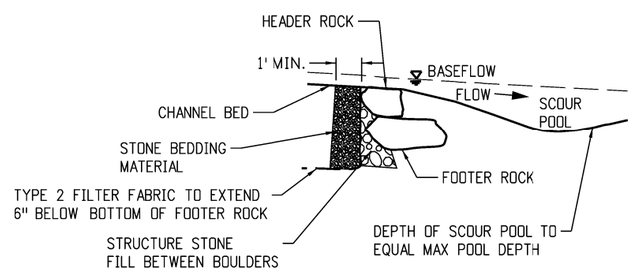

## SECTION A-A (UPSTREAM VIEW)




## SECTION B-B




## SECTION D-D




## SECTION C-C (PROFILE VIEW)

## ROCK CROSS-VANE
SCALE: NTS

30% REVIEW SET

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

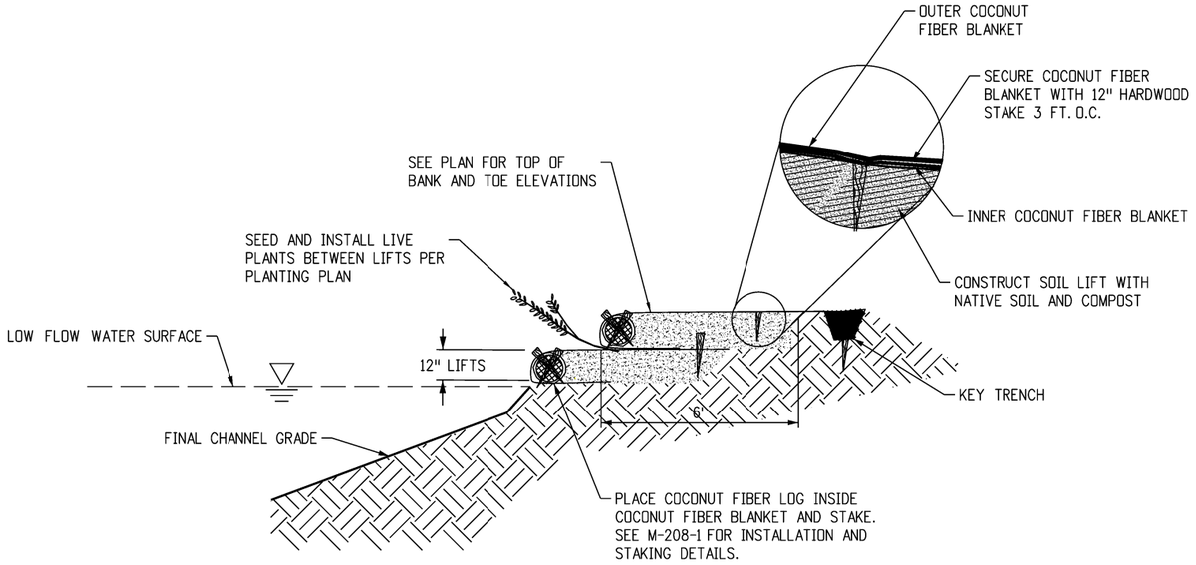
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| MTC | MTC | TPF | 05/13/2016 |

JAMES CANYON STREAM DETAILS (2 OF 3)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 8

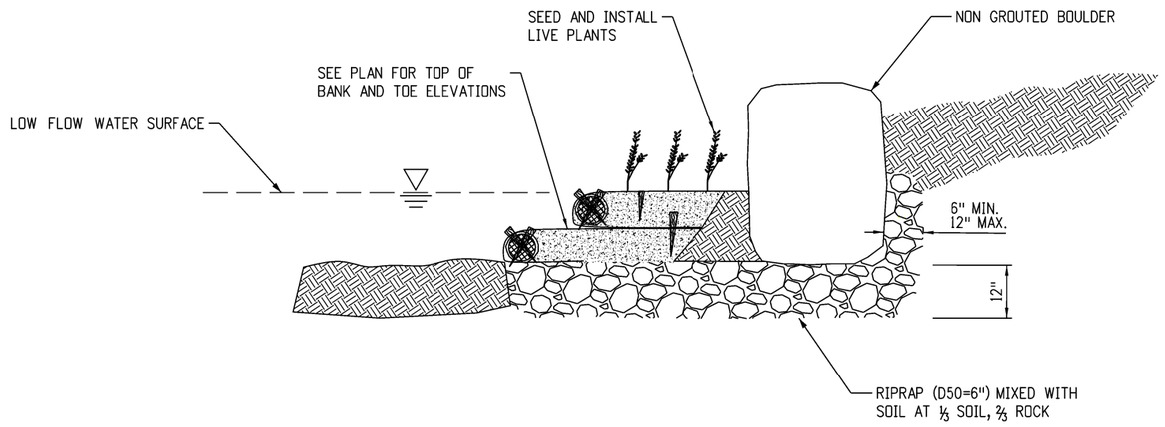
marroquinl 3:53:08 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STDET02.dgn




WRAPPED SOIL LIFT DETAIL
N.T.S.

SOIL LIFT NOTES:

1. SOIL LIFT DETAIL TO BE PAID FOR AS SOIL RETENTION BLANKET (COCONUT) (SOIL LIFT) AT THE SQUARE YARD UNIT OF MEASUREMENT. TOPSOIL COMPACTED FILL AND RIPRAP BEDSOURSE MATERIAL WILL NOT BE PAID FOR SEPARATELY BUT INCLUDED IN THE COST OF WORK.
2. PLANTING TO BE PAID FOR UNDER SECTION 214 PLANTINGS.
3. EROSION LOGS TO BE PAID FOR UNDER SESSION 208 EROSION LOGS (12 INCH).




WRAPPED SOIL LIFT WITH BOULDER EDGE DETAIL
N.T.S.

30% REVIEW SET

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

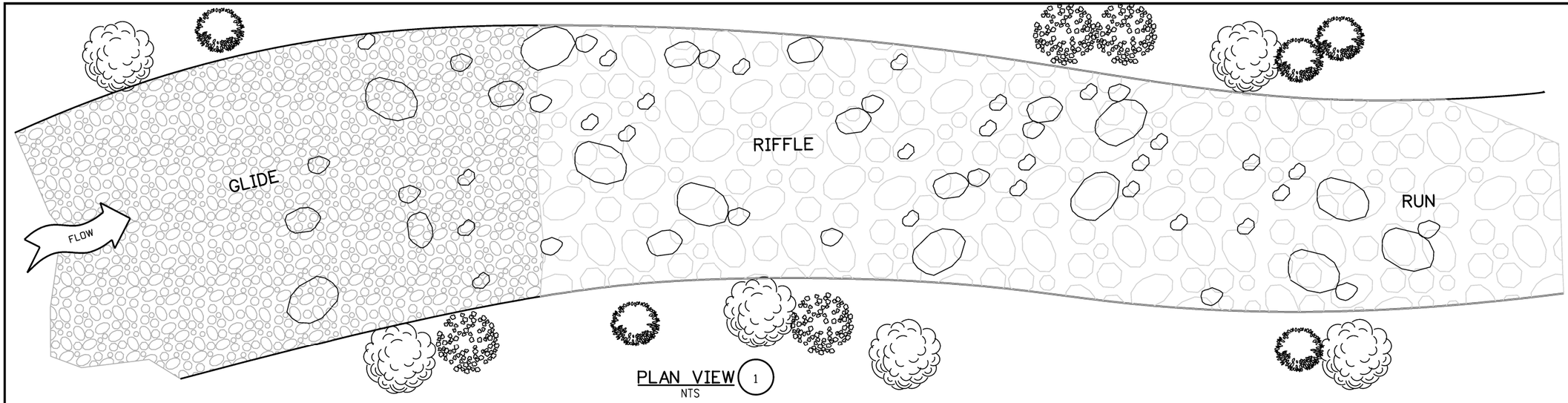
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| MTC | MTC | TPF | 05/13/2016 |

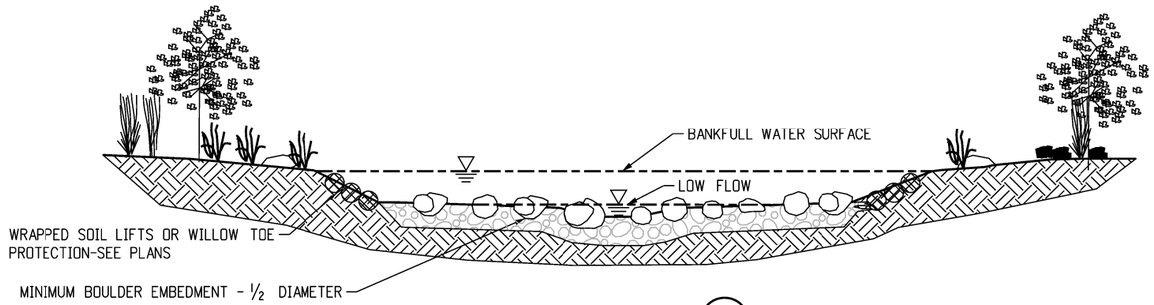
JAMES CANYON STREAM DETAILS (3 OF 3)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 9

marroquinl 3:53:20 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STDET03.dgn



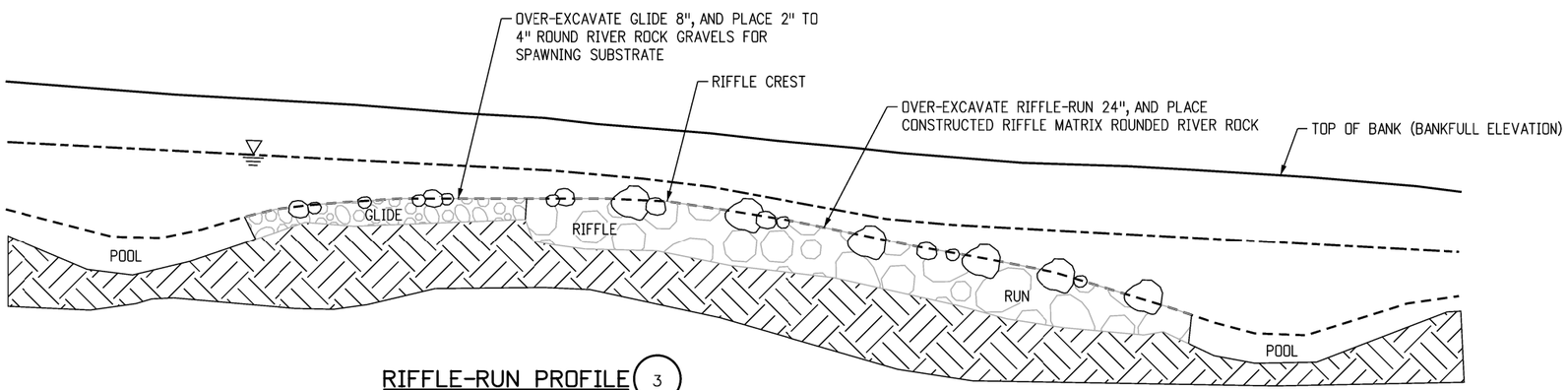

PLAN VIEW (1)
NTS




RIFFLE SECTION (2)
NTS

| CONSTRUCTED RIFFLE HABITAT BOULDER SCHEDULE | | | | | | |
|---|---|---|---|---|---|---|
| BOULDER ELEMENT SIZE (FT.) | RGCS#1 L=230' | RGCS#2 L=201' | RGCS#3 L=230' | RGCS#4 L=270' | RGCS#5 L=170' | RGCS#6 L=120' |
| 1.5' | | | | | | |
| 2.0' | | | | | | |
| 2.75' | | | | | | |
| 3.5' | | | | | | |

| CONSTRUCTED RIFFLE MATRIX GRADATION | | |
|---|---|---|
| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) |
| 100 | 17 | 22.5 |
| 85 | 14.5 | 20 |
| 50 | 11 | 17 |
| 30 | 6.5 | 10.5 |
| 15 | 3.5 | 5.5 |
| MATRIX THICKNESS (T) = 24 INCHES | | |




RIFFLE-RUN PROFILE (3)
NTS

**30% REVIEW SET**

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

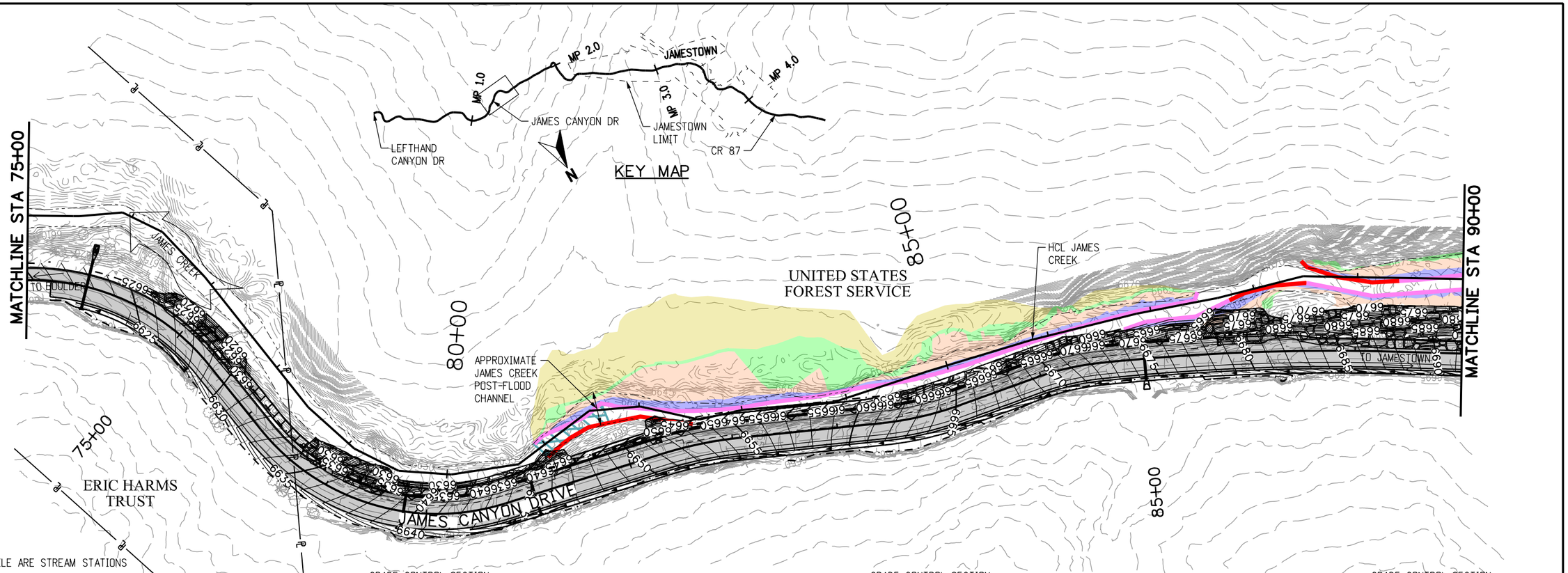
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| MTC | MTC | TPF | 05/13/2016 |

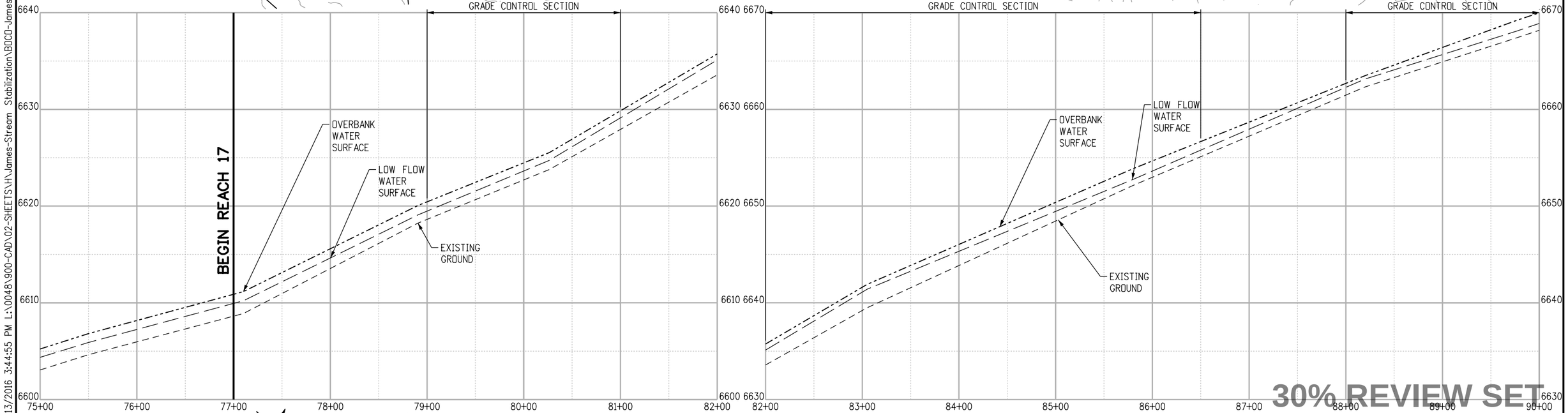
JAMES CREEK STABILIZATION
TYPICAL RIFFLE SECTION

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 10

marroquinl 3:53:43 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_TYPXS01.dgn




NOTE: STATIONS IN PROFILE ARE STREAM STATIONS




0' 50' 100' 200'

N

30%

30% REVIEW SET

811 CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

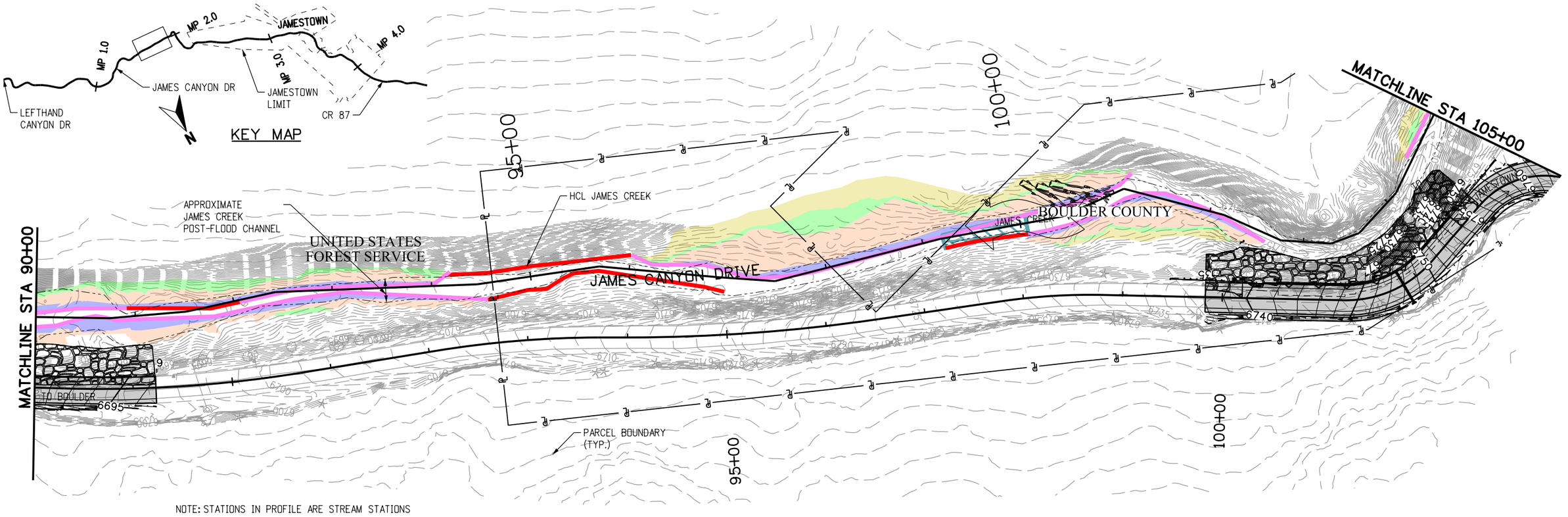
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

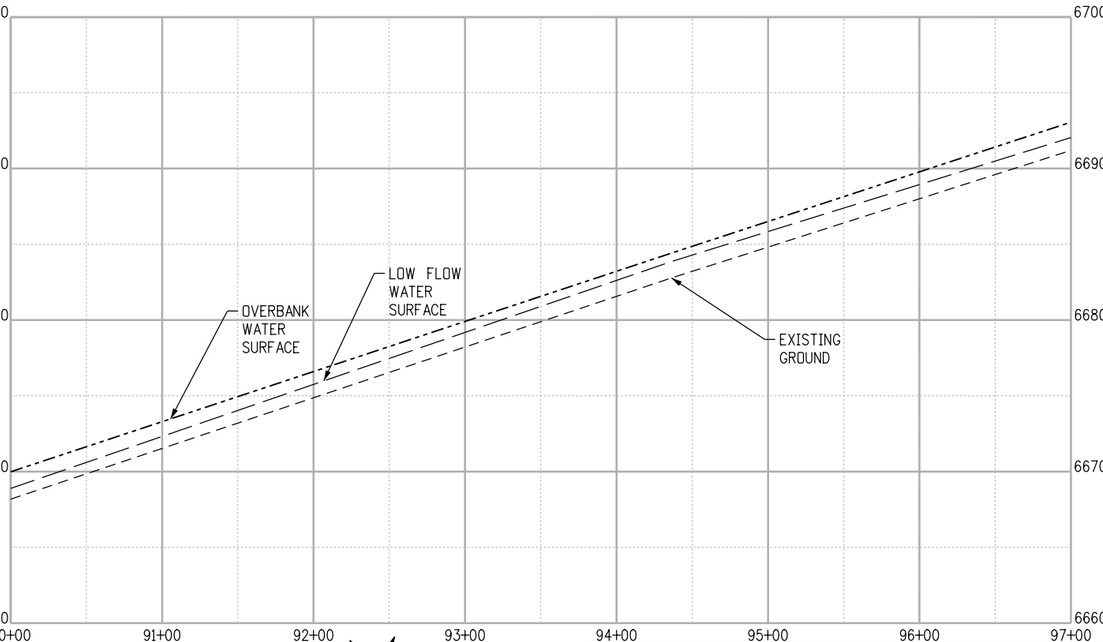
JAMES CANYON
STREAM PLAN & PROFILE
REACH 17 (6 OF 9)

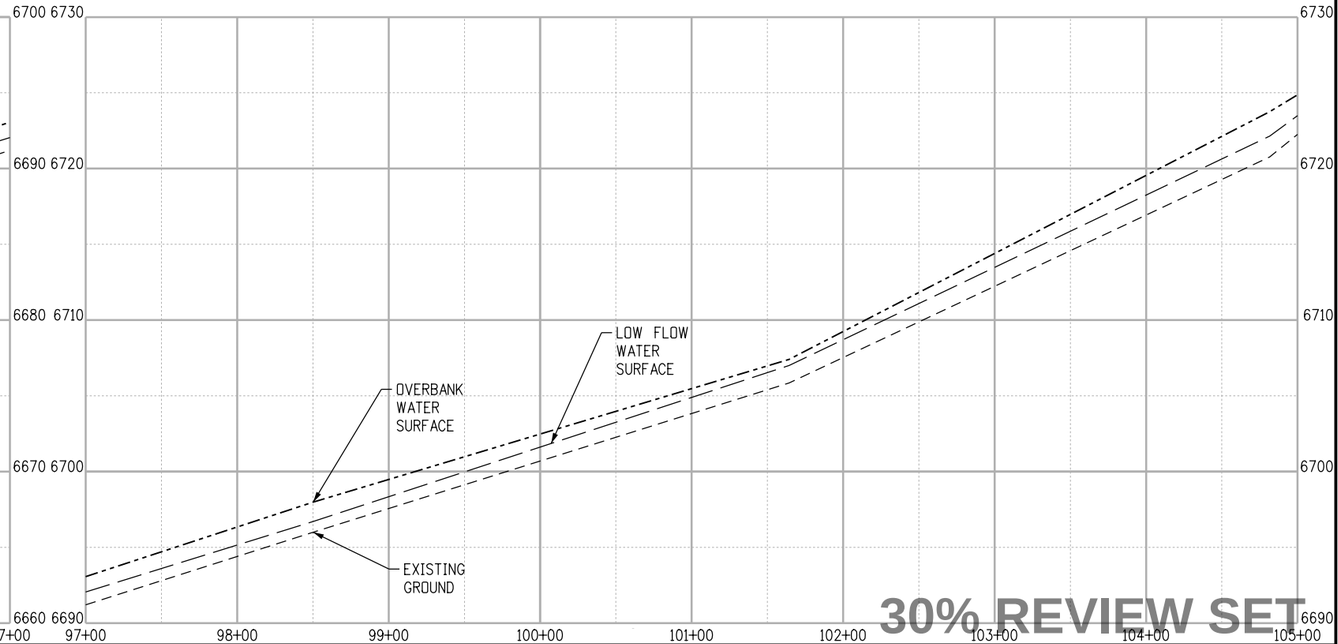
PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 11

marroquinl 5/13/2016 3:44:55 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP06.dgn




NOTE: STATIONS IN PROFILE ARE STREAM STATIONS




30% REVIEW SET

0' 50' 100' 200'

N

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

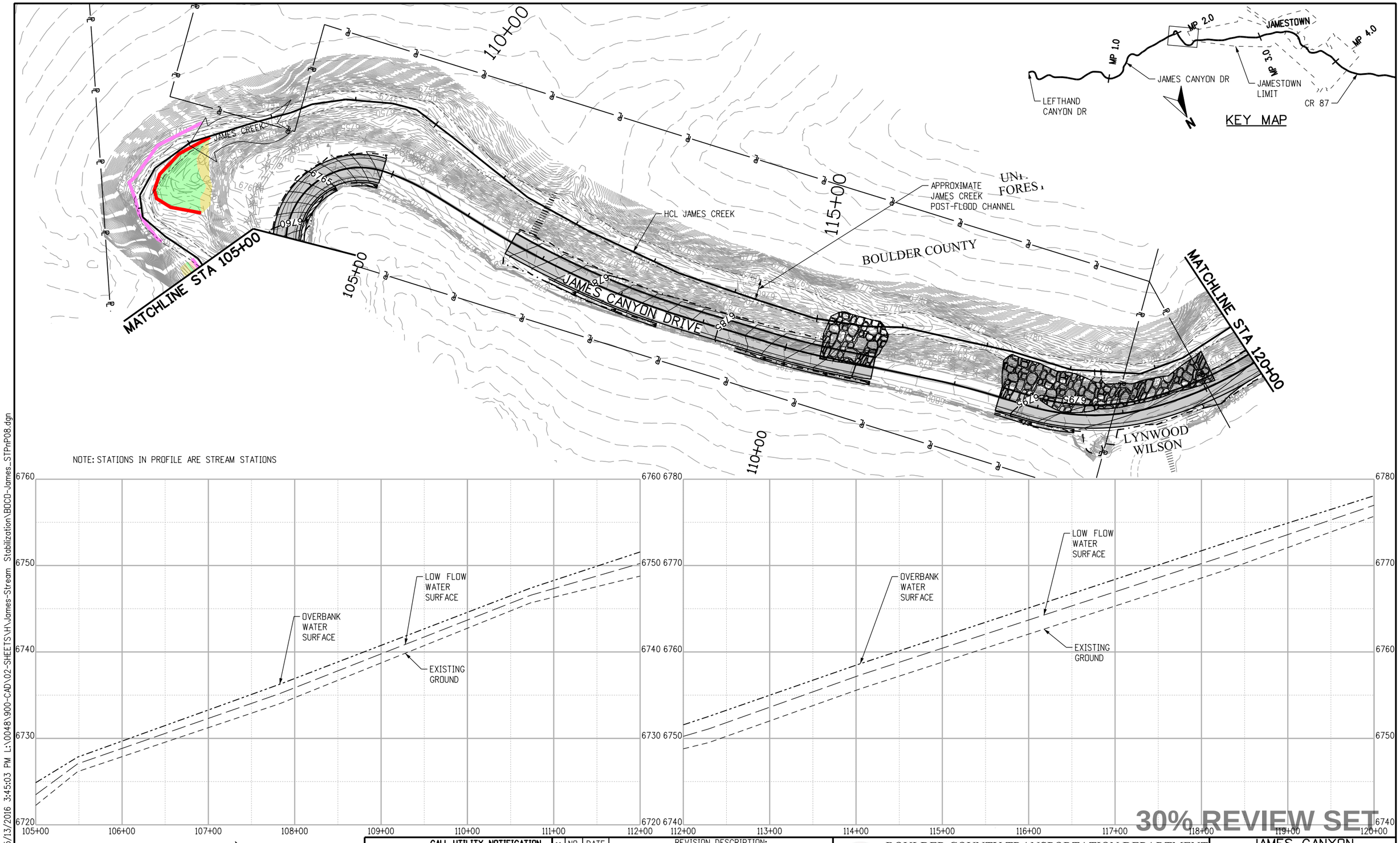
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

# JAMES CANYON STREAM PLAN & PROFILE REACH 17 (7 OF 9)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 12

marroquinl 5/13/2016 3:44:59 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STPnP07.dgn




NOTE: STATIONS IN PROFILE ARE STREAM STATIONS




30% REVIEW SET

0' 50' 100' 200'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

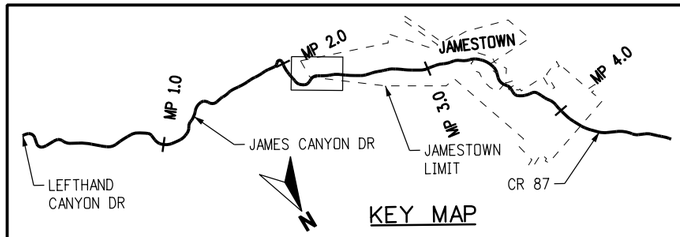
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

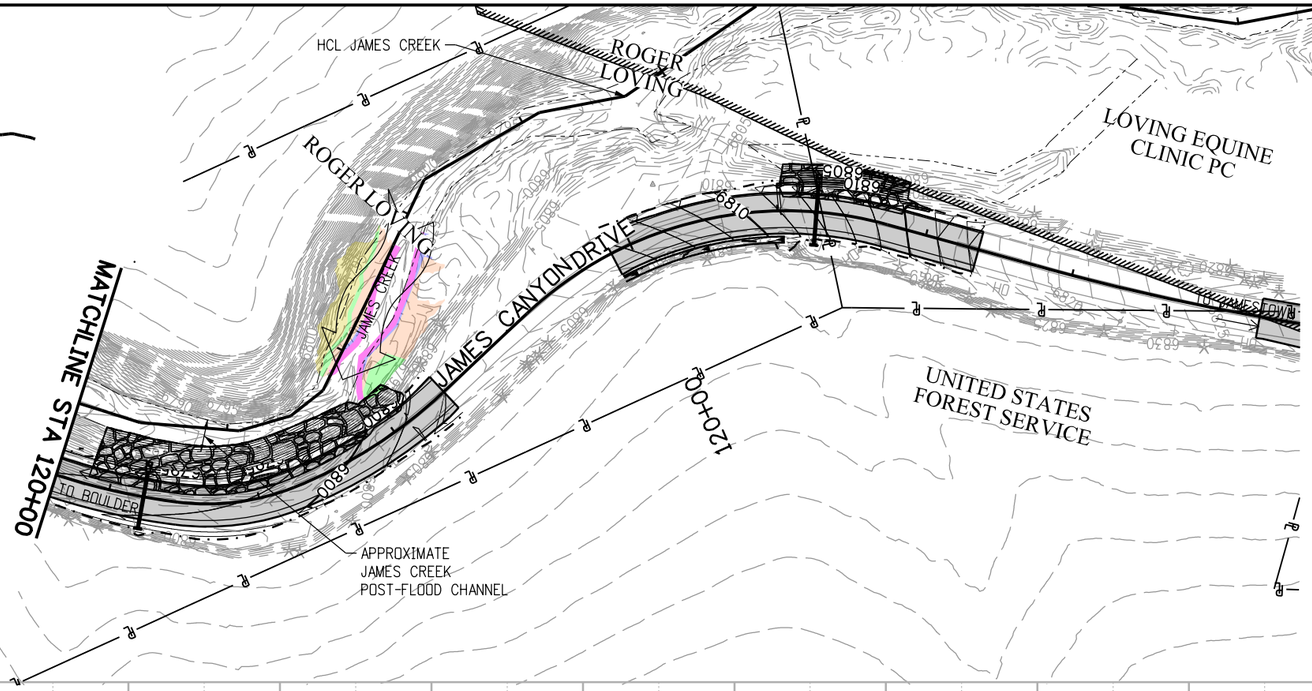
JAMES CANYON
STREAM PLAN & PROFILE
REACH 17 (8 OF 9)

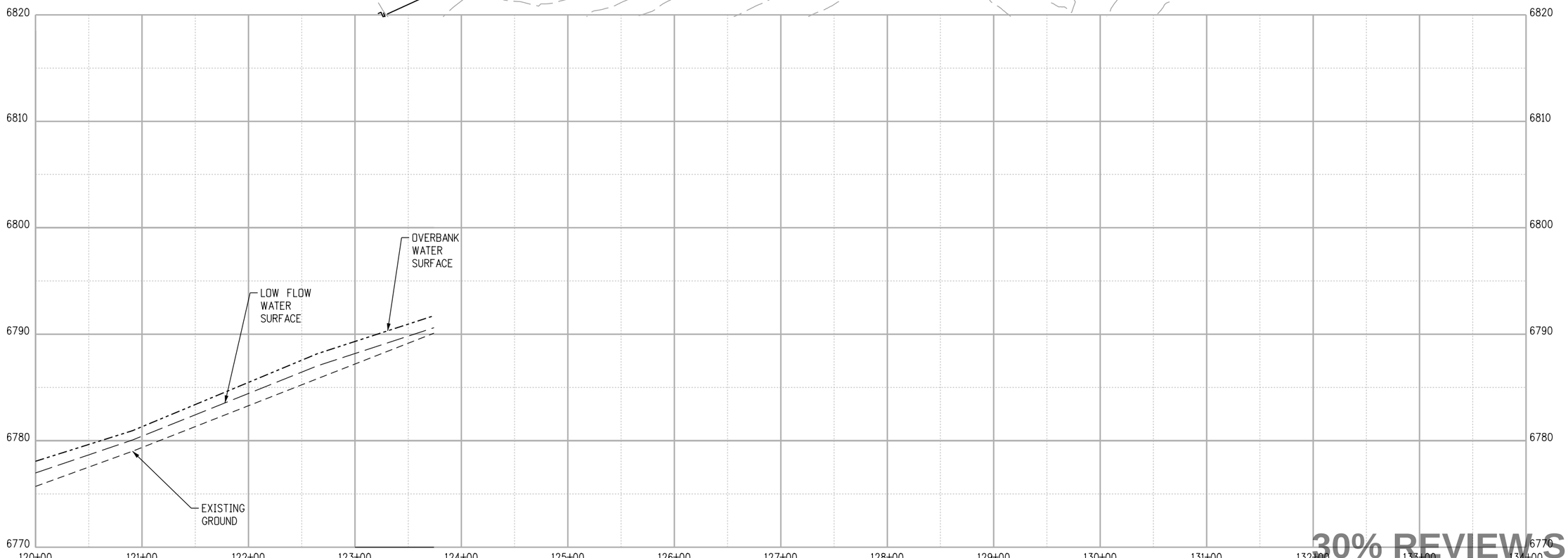
PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 13

marroquinl 5/13/2016 3:45:03 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP08.dgn




KEY MAP




0' 50' 100' 200'

N

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

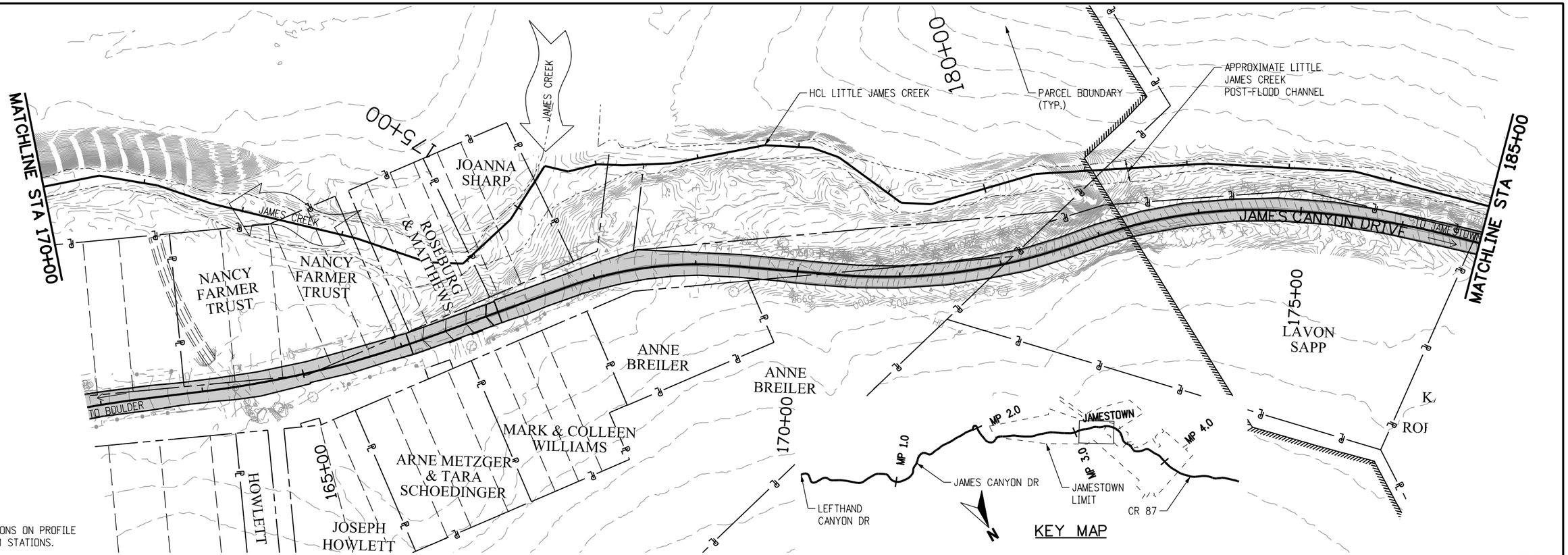
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
PLAN & PROFILE
(9 OF 9)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 14

30% REVIEW SET

marroquinl 5/13/2016 3:45:08 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP09.dgn




30% REVIEW SET

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM PLAN & PROFILE
REACH 21 (10 OF 13)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 15

marroquinl 5/13/2016 3:45:11 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP10.dgn

MARVIN & LAWRENCE HITTLE

UNKNOWN

OWNER UNKNOWN

GERALYNN GRIEVE

KATHLEEN & PETER CARBONE ET AL ROBERT HASTINGS ET AL

UNITED STATES FOREST SERVICE

MATCHLINE STA 185+00

MATCHLINE STA 200+00

180+00

190+00

195+00

185+00

190+00

TO BOULDER

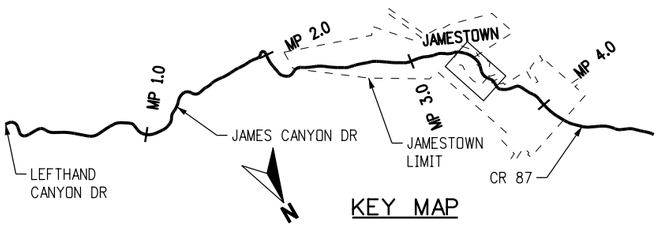
TO JAMESTOWN

JAMES CANYON DRIVE

HCL LITTLE JAMES CREEK

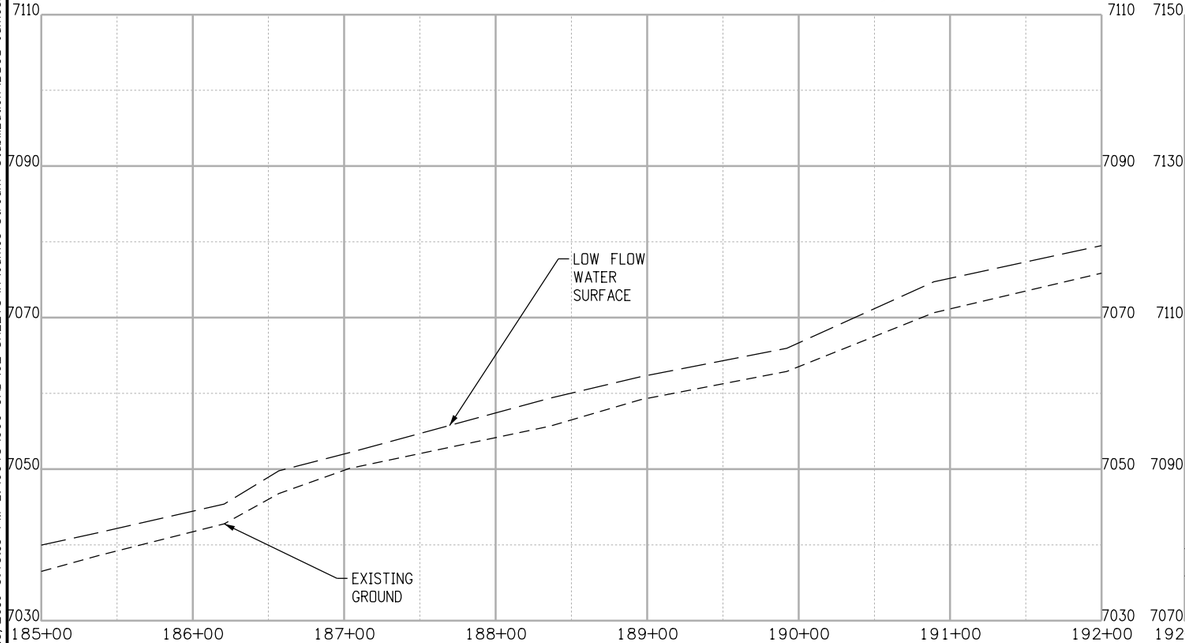
APPROXIMATE LITTLE JAMES CREEK POST-FLOOD CHANNEL

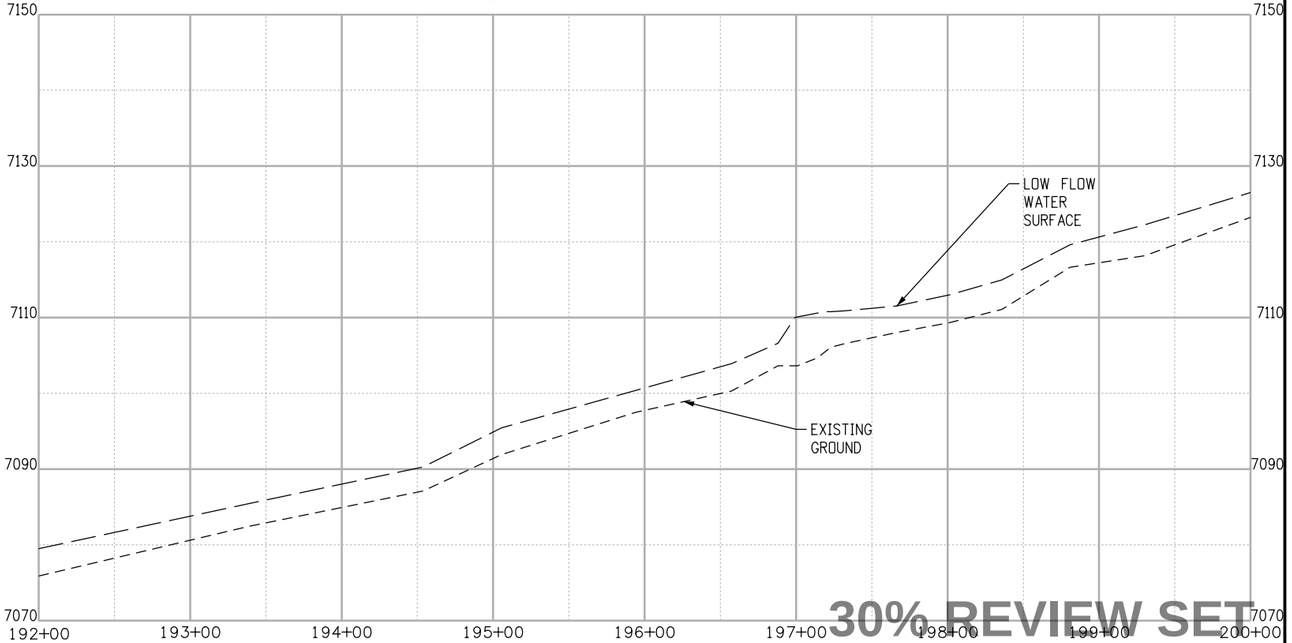
LITTLE JAMES CREEK




KEY MAP

NOTE: STATIONS ON PROFILE ARE STREAM STATIONS.




30% REVIEW SET

0' 50' 100' 200'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

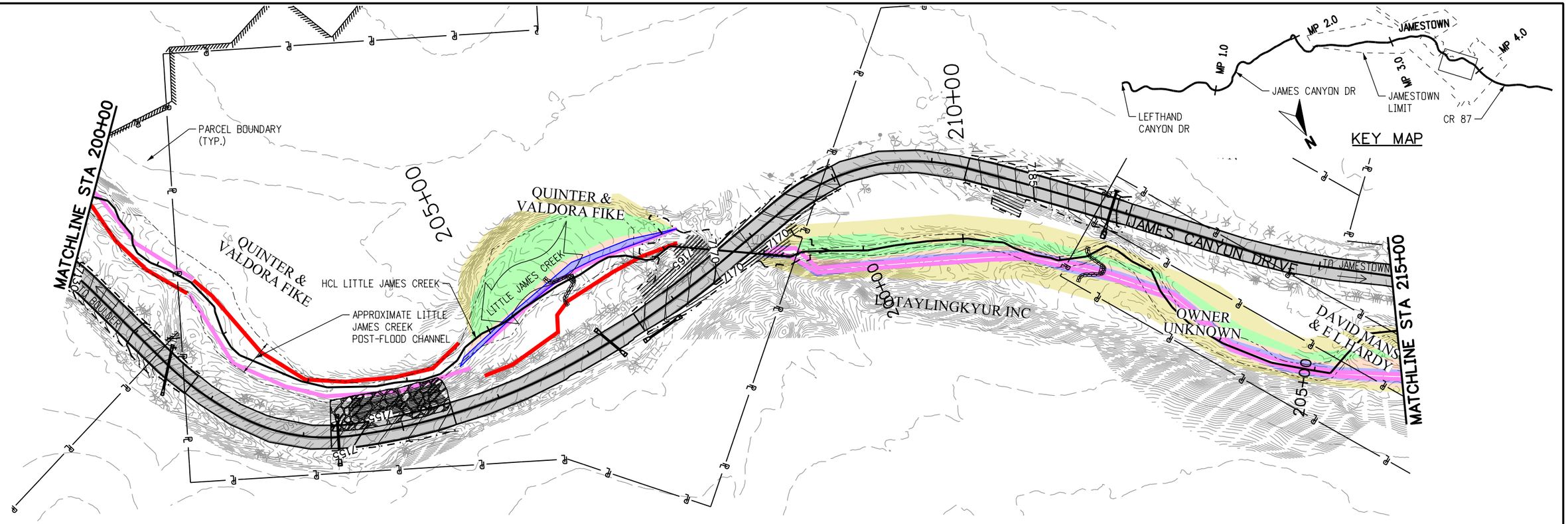
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

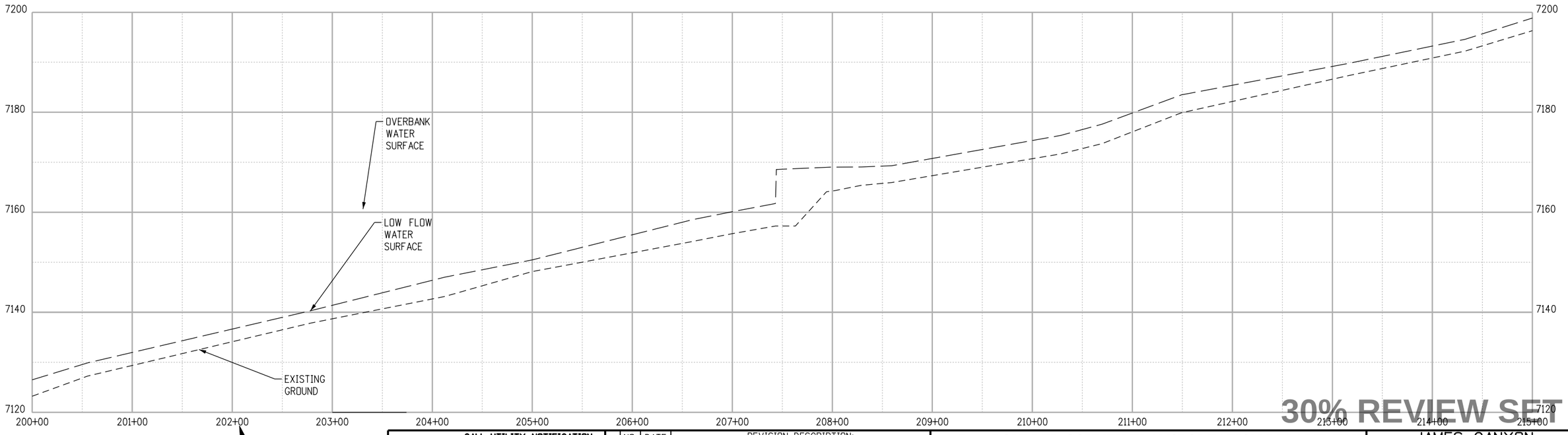
JAMES CANYON
STREAM PLAN & PROFILE
REACH 21 (11 OF 13)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 16

marroquinl 5/13/2016 3:45:15 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STPnP11.dgn




NOTE: STATIONS ON THE PROFILE ARE STREAM STATIONS




30% REVIEW SET

0' 50' 100' 200'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

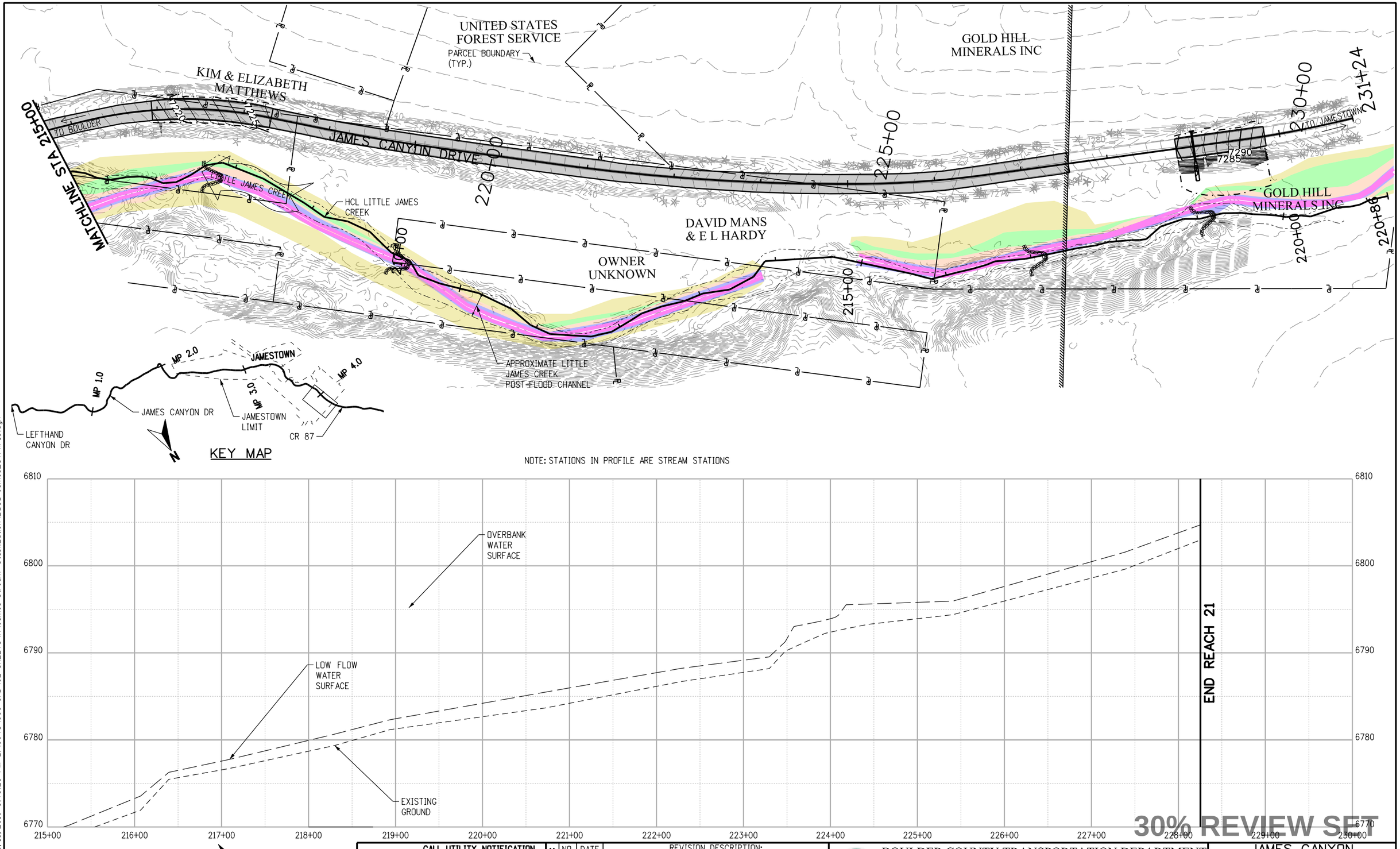
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM PLAN & PROFILE
REACH 21 (12 OF 13)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 17

marroquinl 5/13/2016 3:45:19 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP12.dgn




30%

30% REVIEW SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

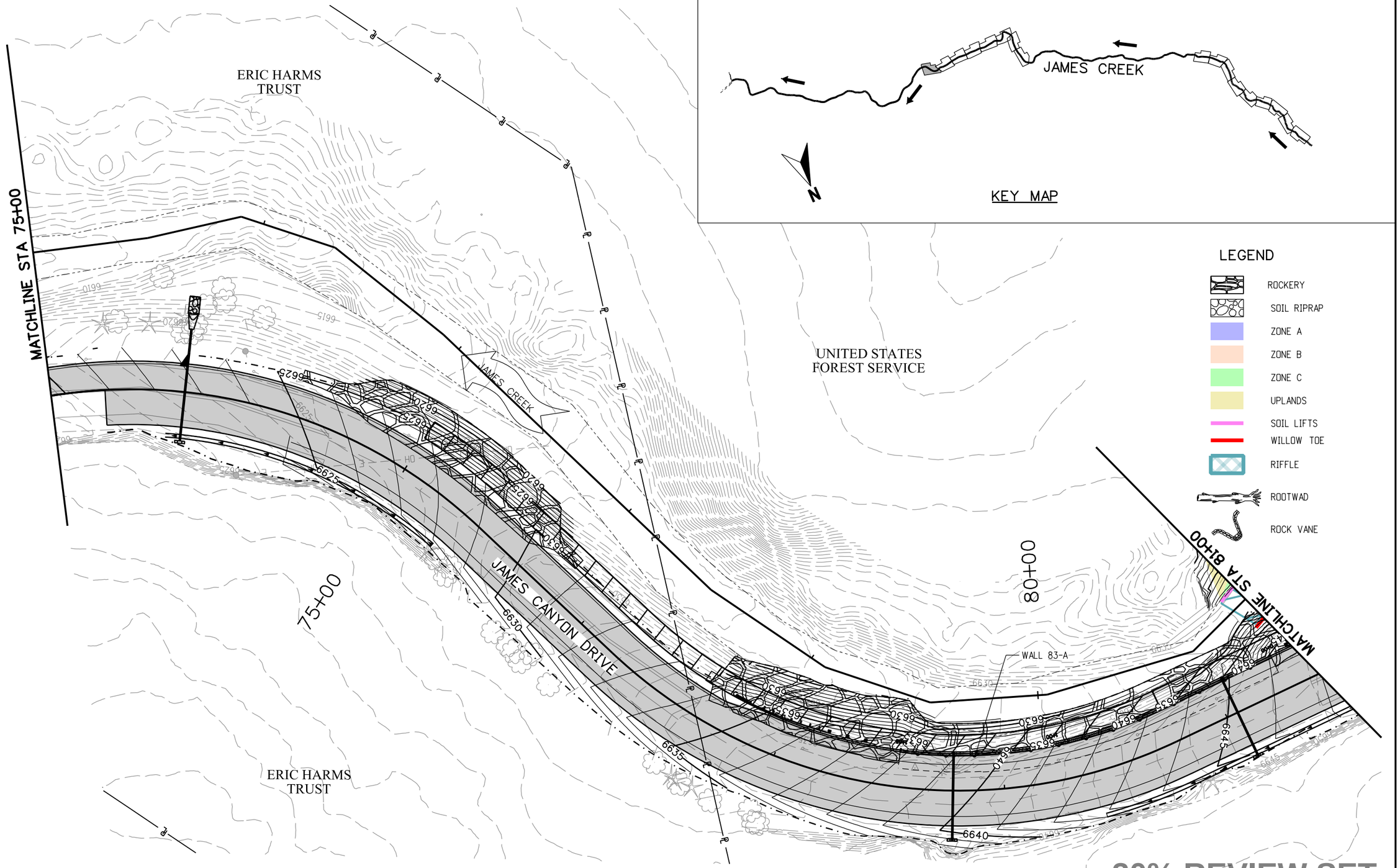
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM PLAN & PROFILE
REACH 21 (13 OF 13)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 18

marroquinl 5/13/2016 3:45:23 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPnP13.dgn







## LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

**30% REVIEW SET**

0' 20' 40' 80'

30%

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

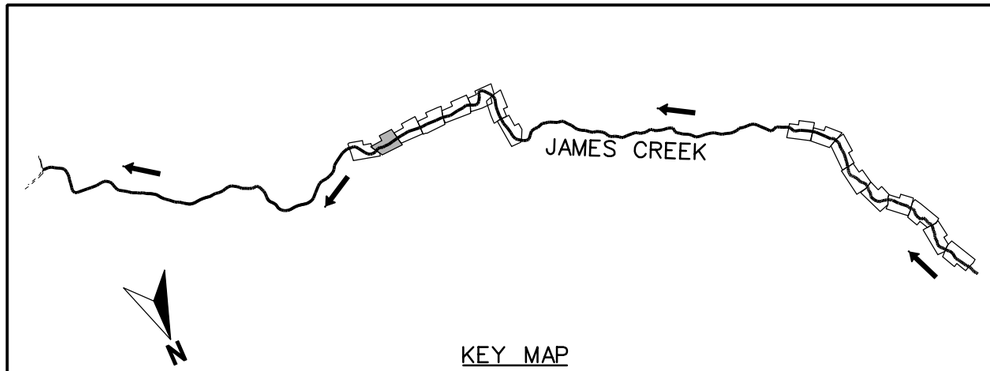
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

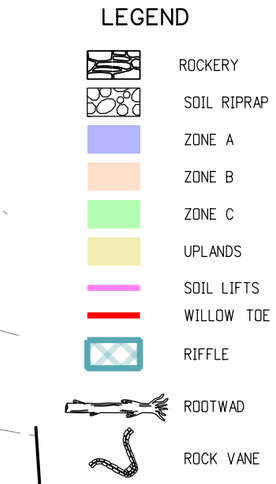
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

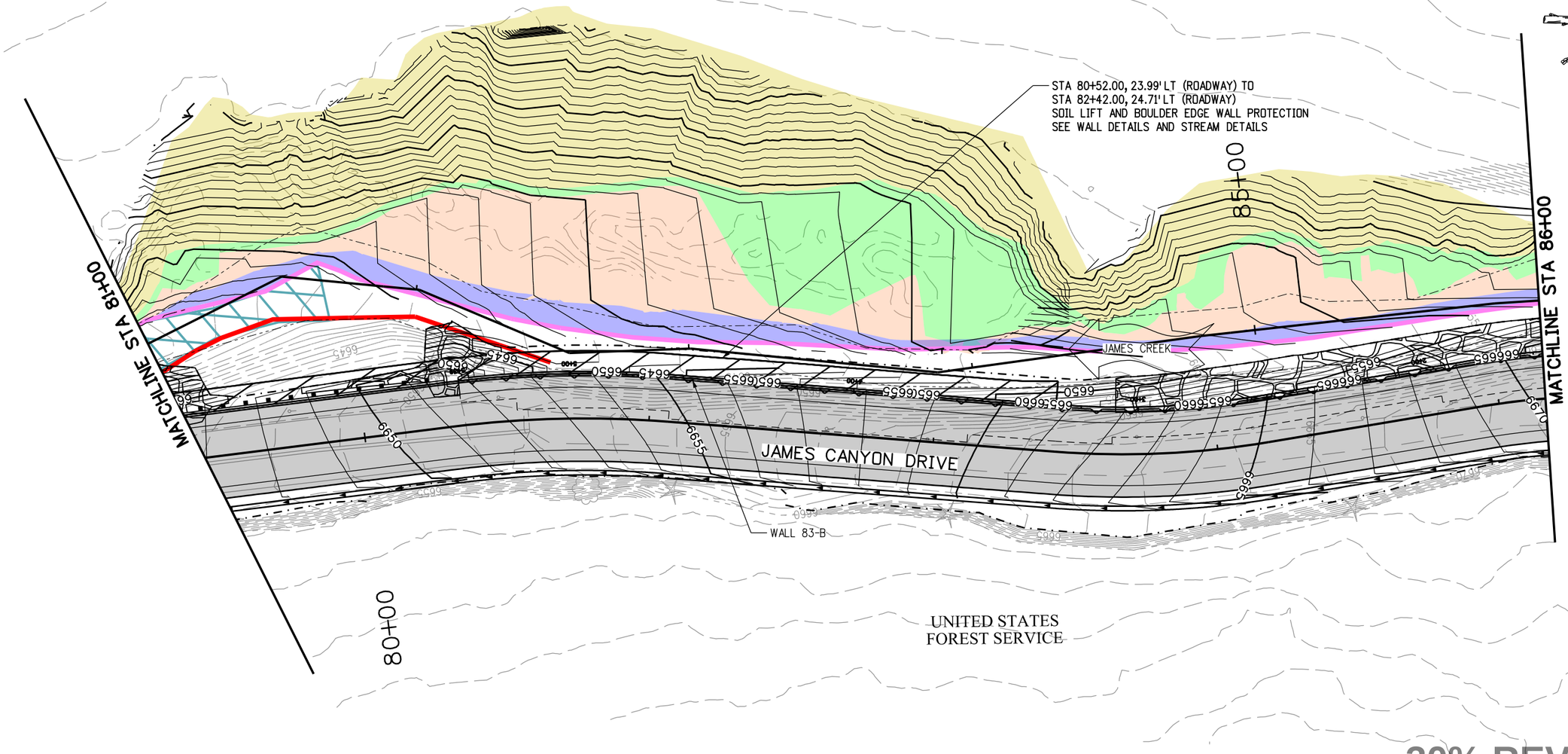
# JAMES CANYON STREAM DETAIL GRADING

PROJECT NO: SEPTI2C24 SEPTI2C91 | SHEET NO: 19

marroquinl 5/13/2016 3:45:27 PM L:\0048\900-CAD\02-SHEETS\HJames-Stream Stabilization\BOCD-James_STPL01.dgn




30% REVIEW SET

0' 20' 40' 80'

N

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

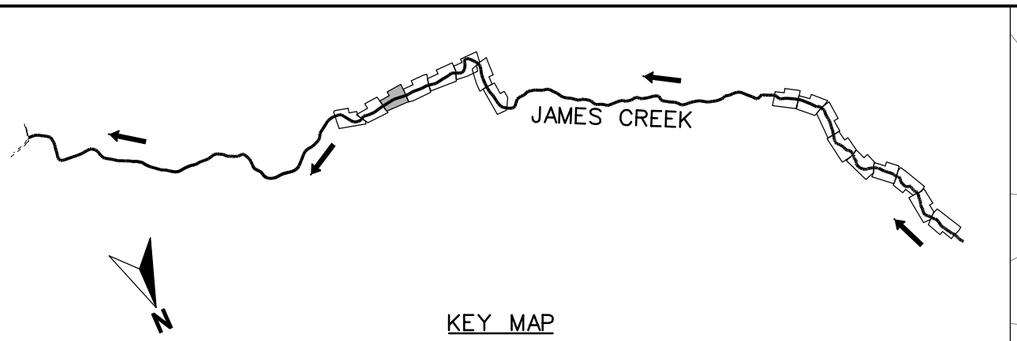
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 20

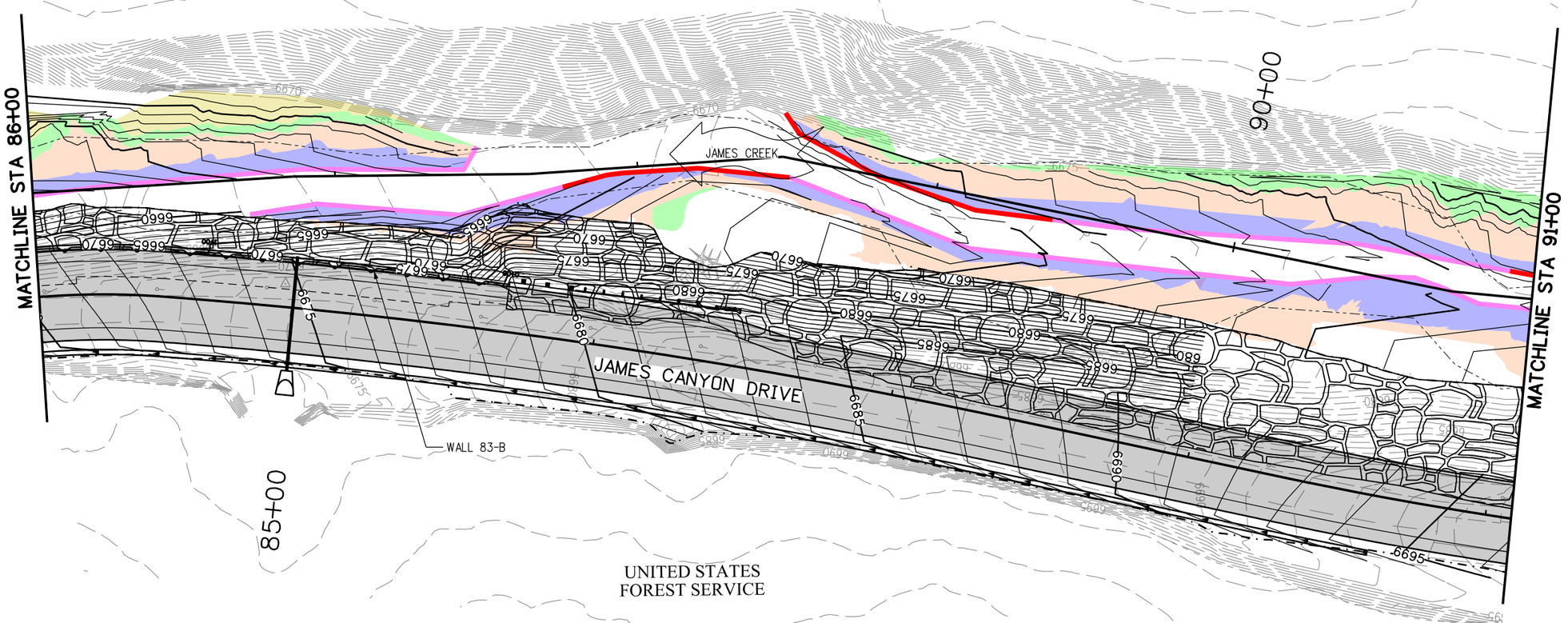
marroquinl 5/13/2016 3:45:30 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL02.dgn




UNITED STATES
FOREST SERVICE

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE




30% REVIEW SET

0' 20' 40' 80'

N

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

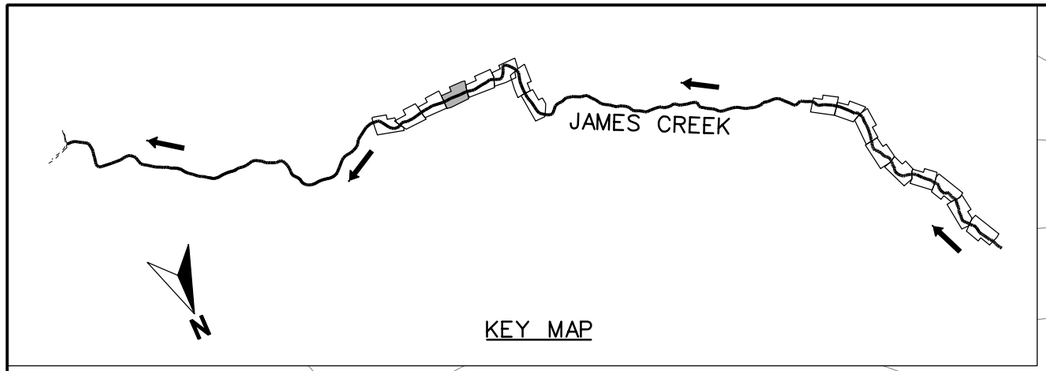
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

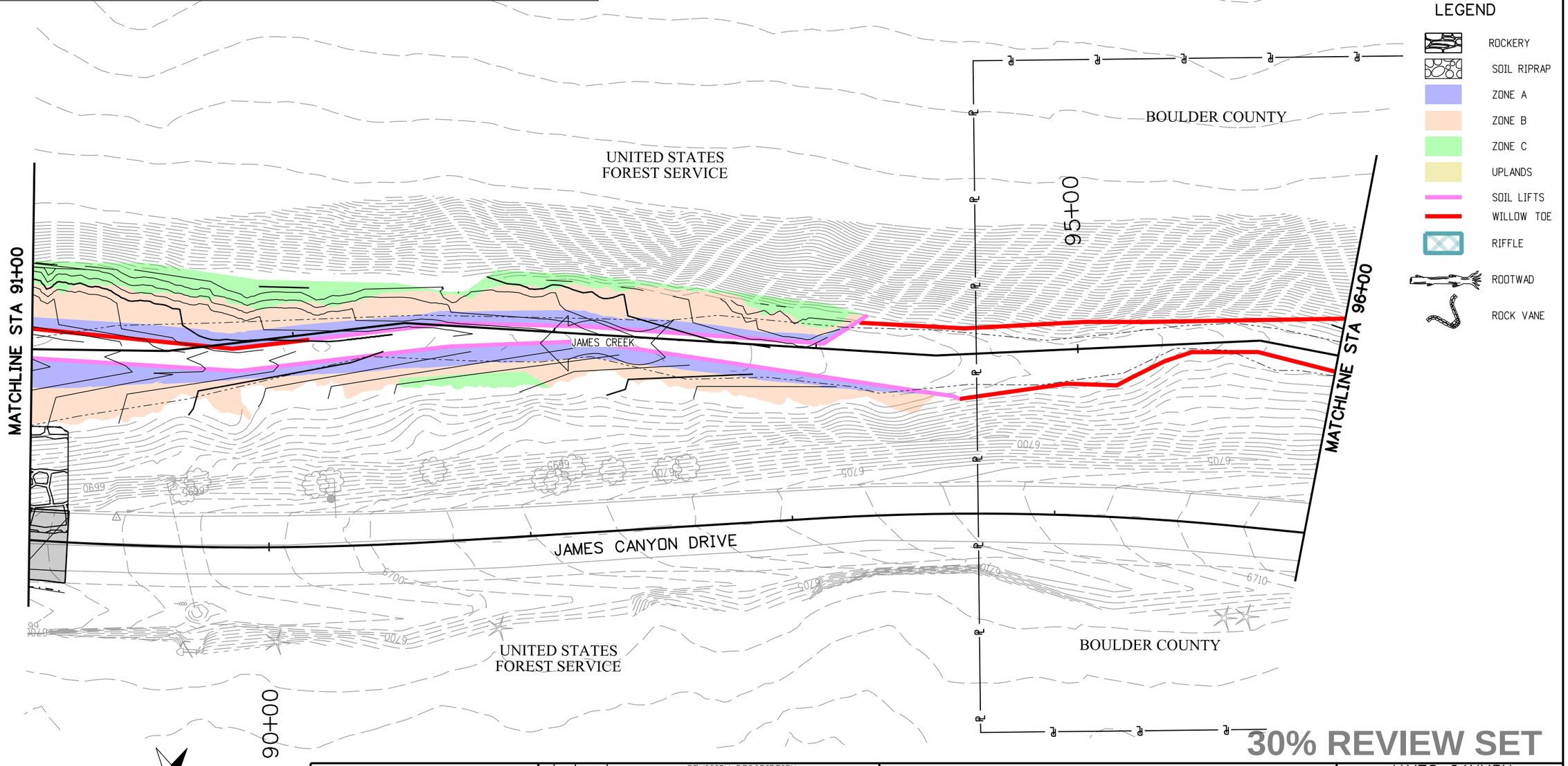
JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 21

marroquinl 5/13/2016 3:45:33 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL03.dgn




30% REVIEW SET

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

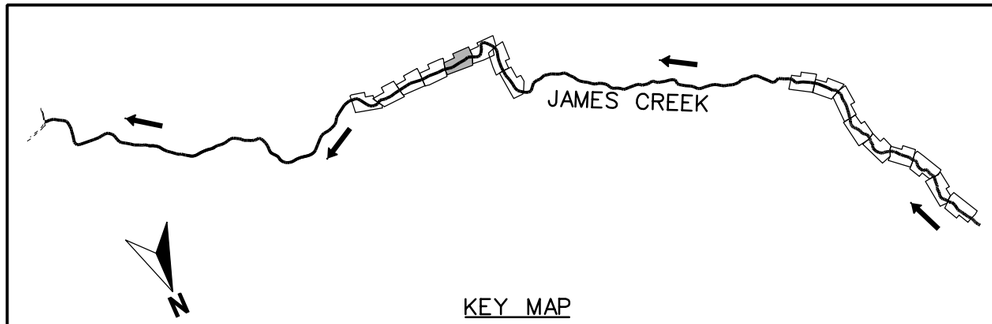
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

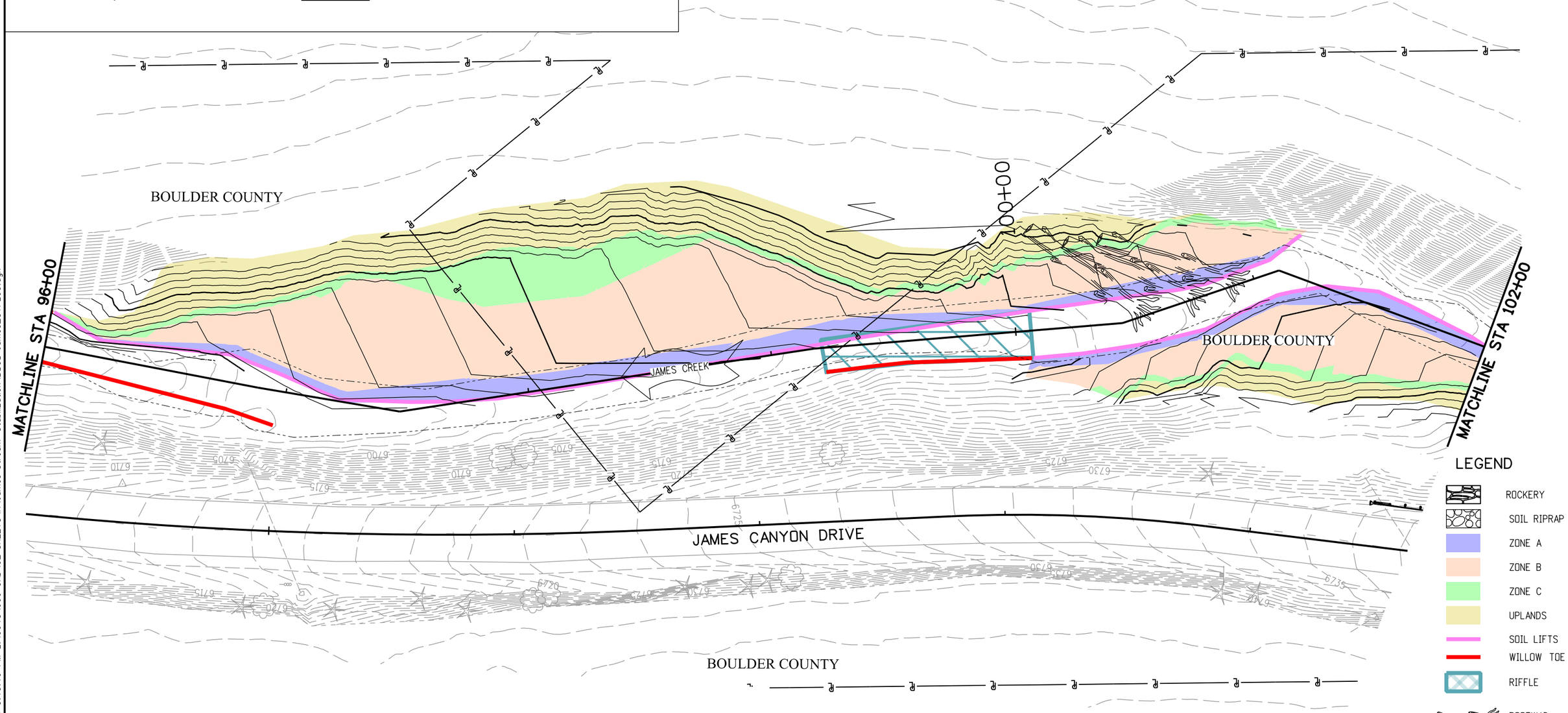
JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 22

marroquinl 5/13/2016 3:45:37 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL04.dgn




0' 20' 40' 80'

N

30%

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

**30% REVIEW SET**

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

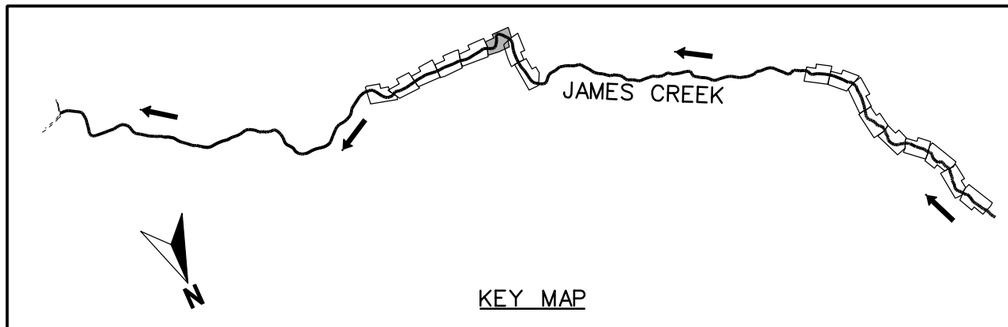
AECOM

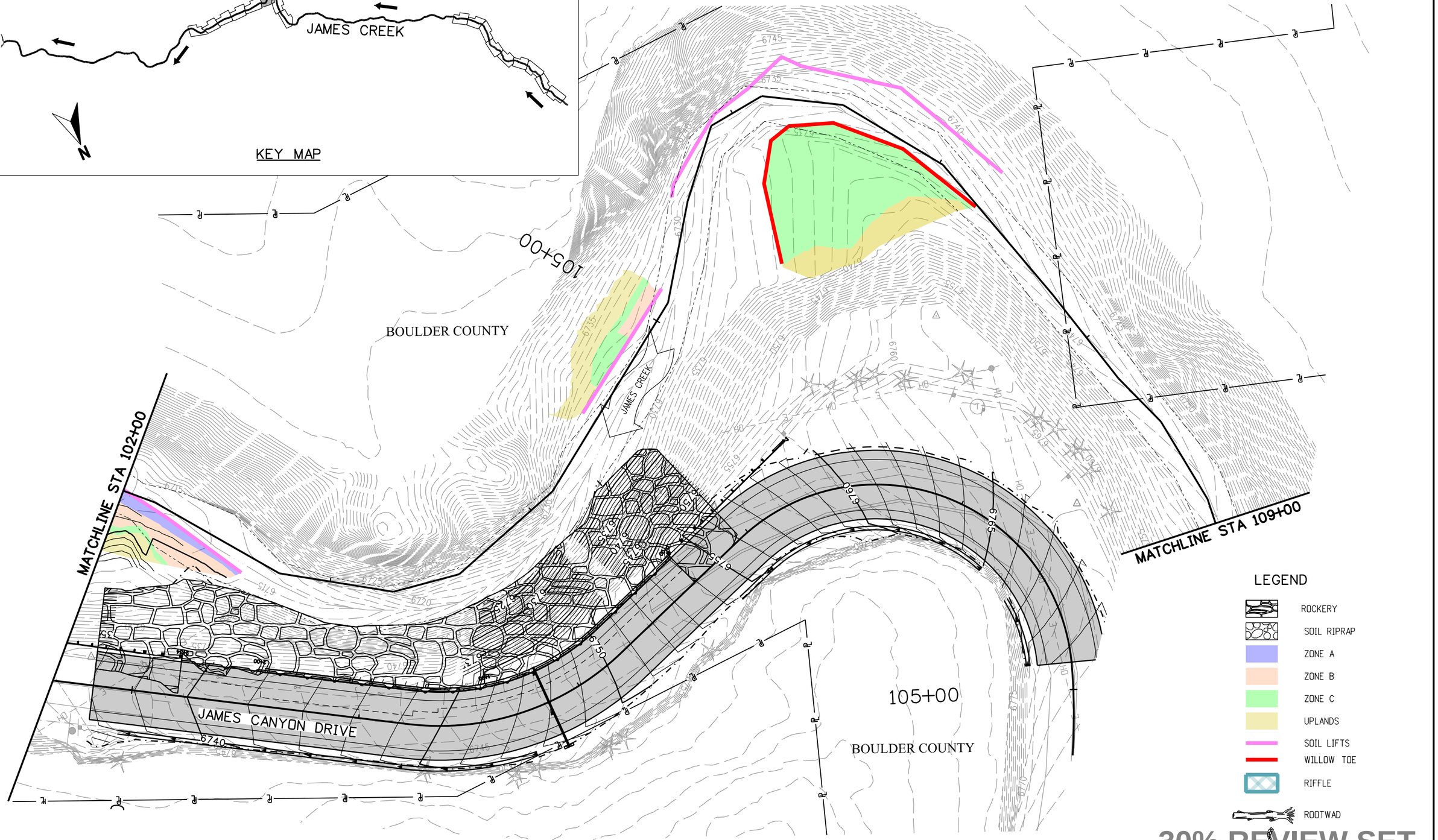
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

# JAMES CANYON STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 23

marroquinl 5/13/2016 3:45:40 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL05.dgn




LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

30% REVIEW SET

0' 20' 40' 80'

N

30%

811 CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPTI2C24 SEPTI2C91 | SHEET NO: 24

marroquinl 5/13/2016 3:45:44 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STPL06.dgn

UNITED STATES
FOREST SERVICE

BOULDER COUNTY

110+00

MATCHLINE STA 109+00

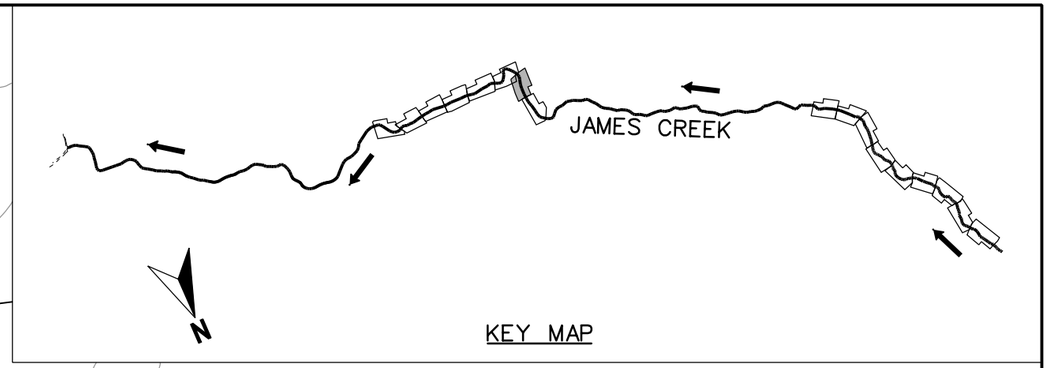
MATCHLINE STA 114+00

JAMES CREEK

JAMES CANYON DRIVE

105+00

BOULDER COUNTY




## LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

**30% REVIEW SET**

0' 20' 40' 80'

N

30%

811 **CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

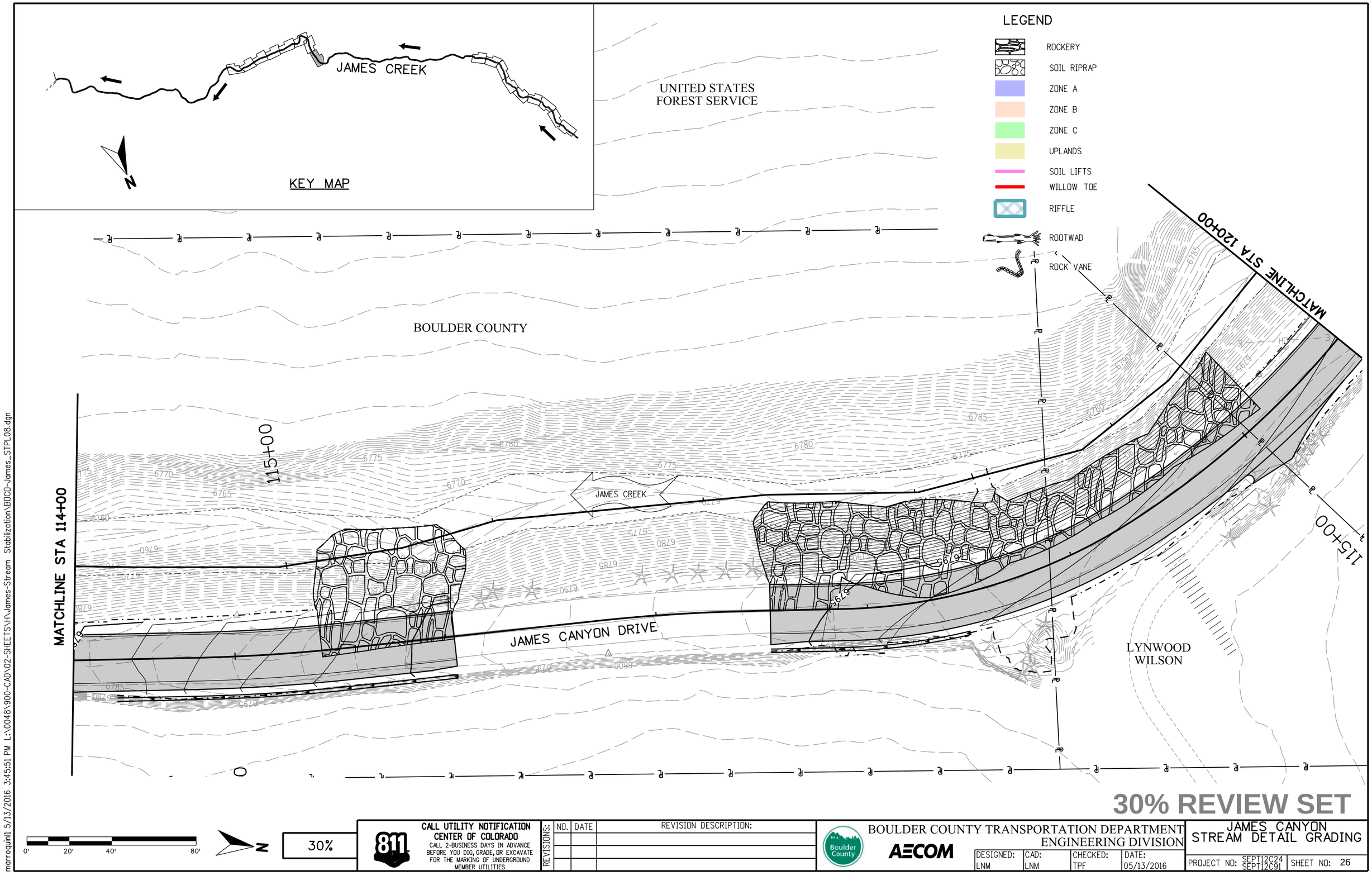
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

# JAMES CANYON STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 25

marroquinl 5/13/2016 3:45:47 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL07.dgn




30% REVIEW SET

0' 20' 40' 80'

N

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

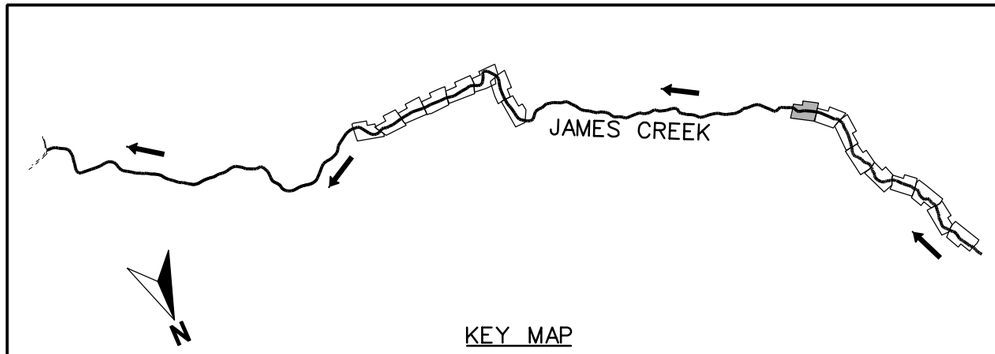
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 26

marroquinll 5/13/2016 3:45:51 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STPL08.dgn




KEY MAP

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

UNKNOWN OWNER

GERALYNN GRIEVE

MATCHLINE STA 178+00

MATCHLINE STA 183+00

180+00

170+00

JAMES CREEK

JAMES CANYON DRIVE

30% REVIEW SET

0' 20' 40' 80'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

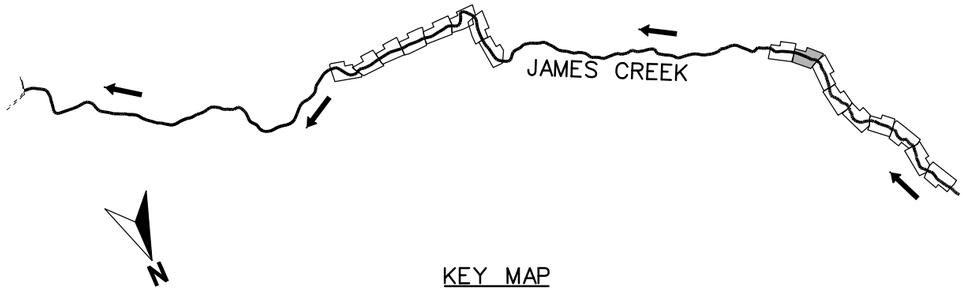
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 27

marroquinl 5/13/2016 3:45:54 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James...STPL09.dgn




KEY MAP

GERALYNN GRIEVE

MARVIN &
LAWRENCE
HITTLE

185+00

MATCHLINE STA 183+00

JAMES CREEK

JAMES CANYON DRIVE

MATCHLINE STA 188+00

175+00

LAVON
SAPP

KATHLEEN & PETER
CARBONE ET AL
ROBERT HASTINGS ET AL

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

0' 20' 40' 80'

N

30%

**30% REVIEW SET**

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

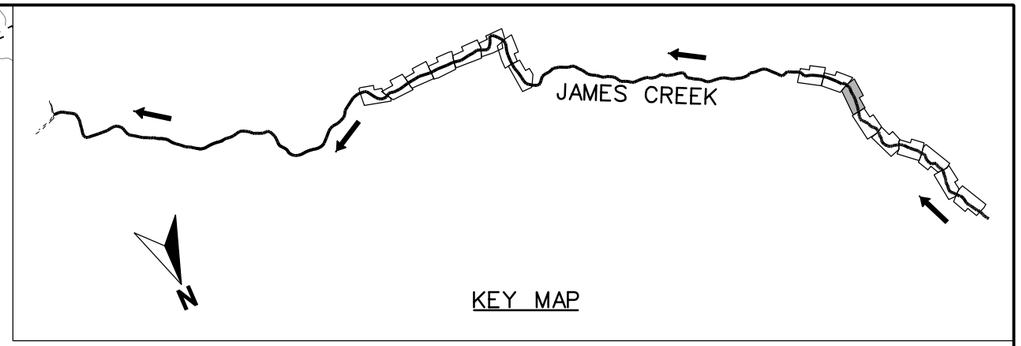
PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 28

marroquinl 5/13/2016 3:45:57 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL10.dgn

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE




OWNER
UNKNOWN

190+00

JAMES CREEK

GERALYNN
GRIEVE

MATCHLINE STA 188+00

MATCHLINE STA 194+00

JAMES CANYON DRIVE

180+00

185+00

**30% REVIEW SET**

0' 20' 40' 80'

N

30%

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

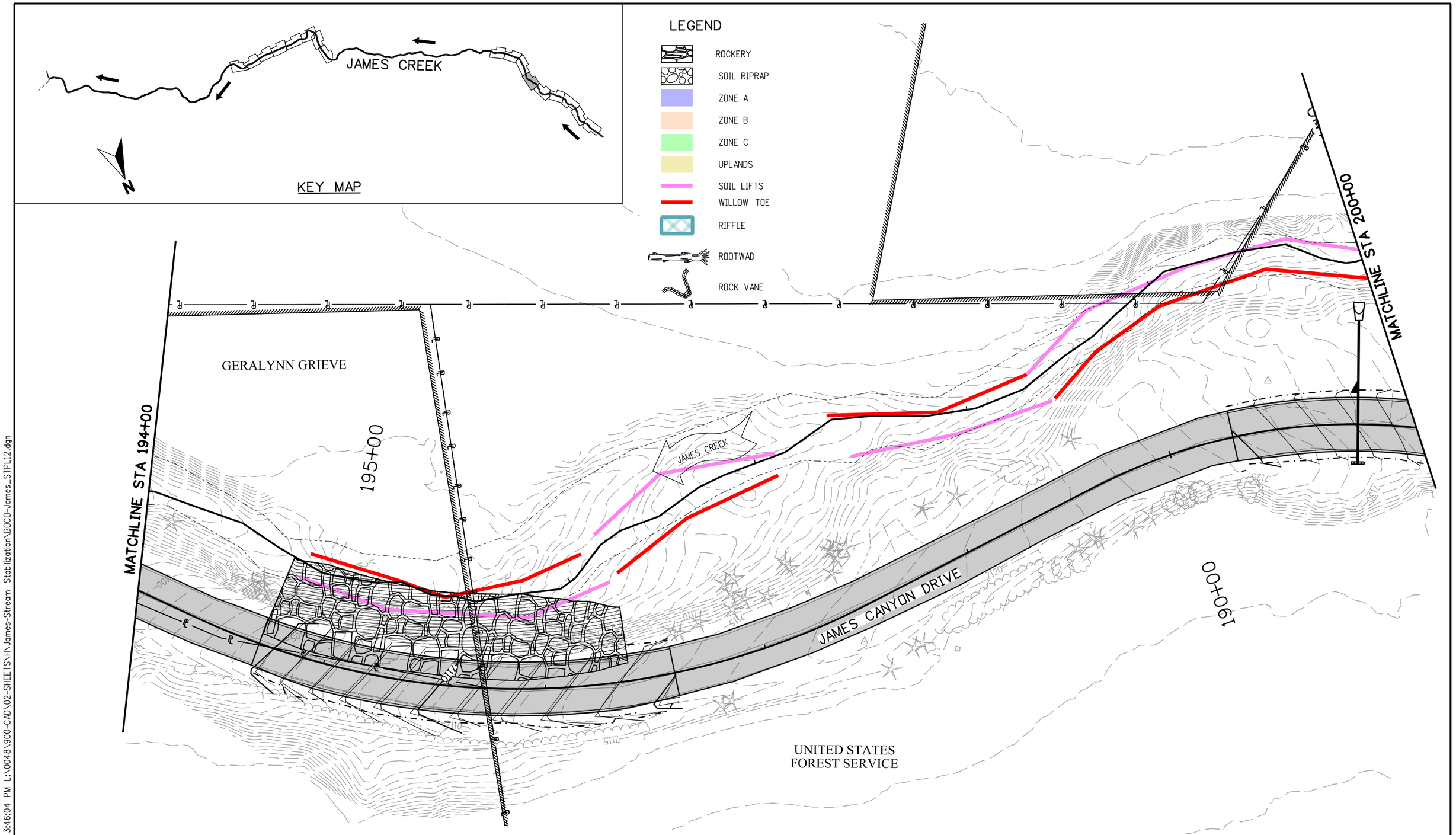
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 29

marroquinl 5/13/2016 3:46:01 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James...STPL11.dgn




30% REVIEW SET

0' 20' 40' 80'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

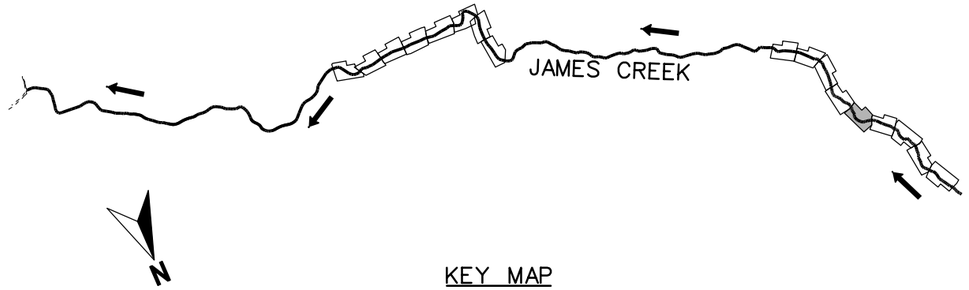
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 30

marroquinl 5/13/2016 3:46:04 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL12.dgn




LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

QUINTER &
VALDORA FIKE

MATCHLINE STA 200+00

MATCHLINE STA 206+00

205+00

195+00

7130

7155

JAMES CREEK

JAMES CANYON DRIVE

30% REVIEW SET

0' 20' 40' 80'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

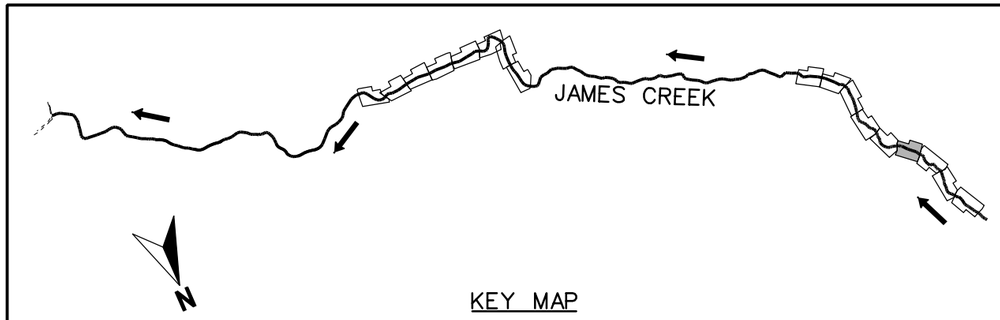
| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

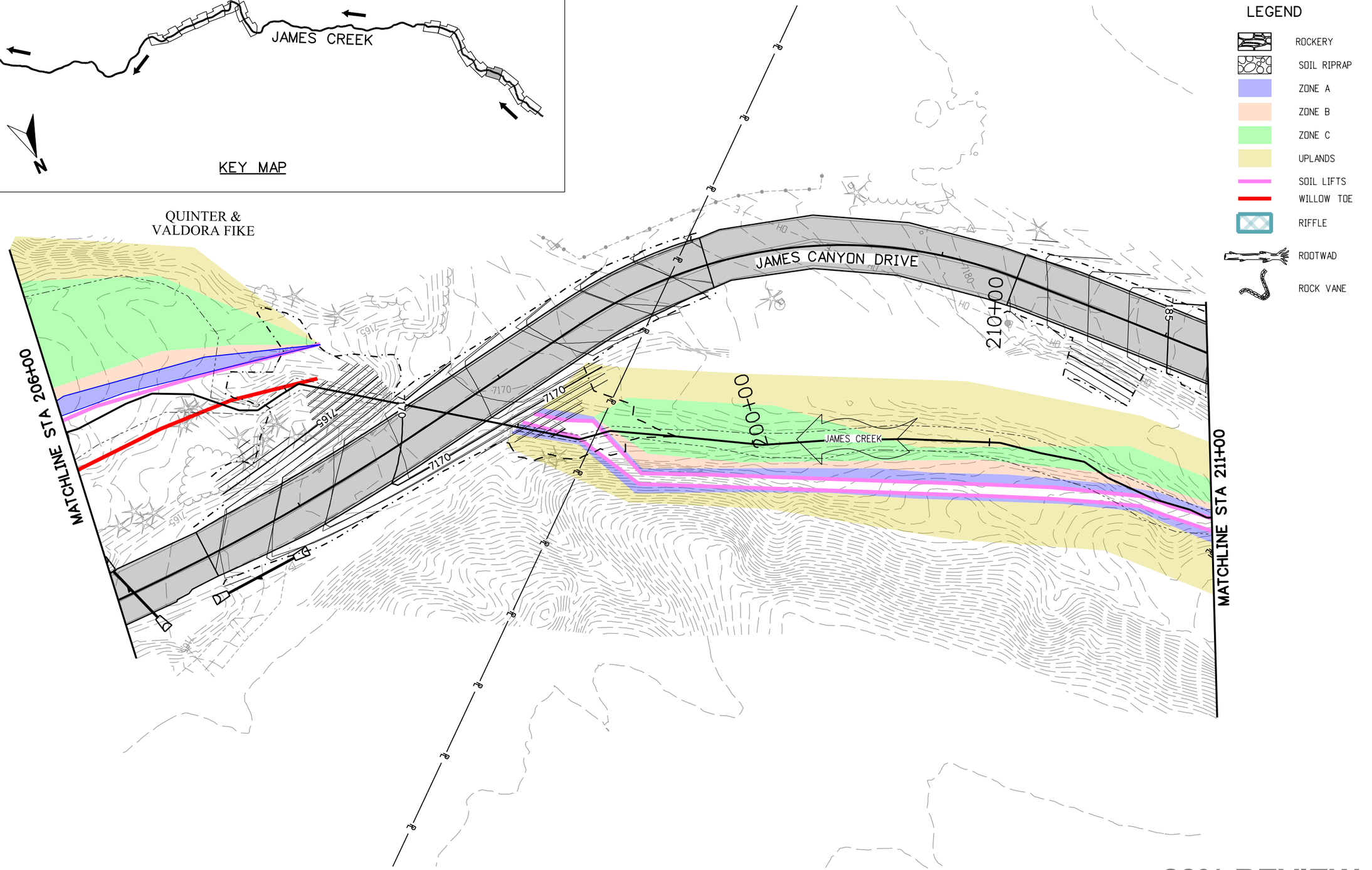
JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24
SEPT12C91

SHEET NO: 31

marroquinl 5/13/2016 3:46:08 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL13.dgn




LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

**30% REVIEW SET**

0' 20' 40' 80'

30%

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

# JAMES CANYON STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 32

marroquinl 5/13/2016 3:46:11 PM L:\0048\900-CAD\02-SHEETS\HJames-Stream Stabilization\BOCO-James_STPL14.dgn

OWNER
UNKNOWN

KIM & ELIZABETH
MATTHEWS

JAMES CANYON DRIVE

215+00

205+00

MATCHLINE STA 214+00

MATCHLINE STA 217+00

OWNER
UNKNOWN

JAMES CREEK

## LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

0' 20' 40' 80'

N

30%

JAMES CREEK

N

KEY MAP

**30% REVIEW SET**

**CALL UTILITY NOTIFICATION CENTER OF COLORADO**
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 33

marroquinl 5/13/2016 3:46:15 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James...STPL15.dgn

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

KIM & ELIZABETH MATTHEWS

JAMES CANYON DRIVE

MATCHLINE STA 217+00

210+00

220+00

OWNER UNKNOWN

MATCHLINE STA 223+00

JAMES CREEK

KEY MAP

JAMES CREEK

N

30% REVIEW SET

0' 20' 40' 80'

30%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 34

marroquinl 5/13/2016 3:46:18 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STPL16.dgn

JAMES CANYON DRIVE

DAVID MANS
& E L HARDY

MATCHLINE STA 223+00

215+00

225+00

MATCHLINE STA 229+00

JAMES CREEK

7270

7280

7285

LEGEND

- ROCKERY
- SOIL RIPRAP
- ZONE A
- ZONE B
- ZONE C
- UPLANDS
- SOIL LIFTS
- WILLOW TOE
- RIFFLE
- ROOTWAD
- ROCK VANE

0' 20' 40' 80'

KEY MAP

JAMES CREEK

N

30%

# 30% REVIEW SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

| REVISIONS: | NO. | DATE | REVISION DESCRIPTION: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

| DESIGNED: | CAD: | CHECKED: | DATE: |
|---|---|---|---|
| LNM | LNM | TPF | 05/13/2016 |

JAMES CANYON
STREAM DETAIL GRADING

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 35

marroquinl 5/13/2016 3:46:22 PM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James...STPL17.dgn