LESTER PARK:
TRAIL TYPE = BLUE BUMP PUMP (1 WAY)
GROSS LENGTH SUMMARY: ±18,170 LF (33.5 MILES)

NOTE:
CONTRACTOR CANNOT INVOICE FOR BOTH TRAIL CONSTRUCTION TYPES A, B & C AND CONSTRUCTED FEATURES OF A GIVEN LINEAR FOOT OF TRAIL.

TRAIL CONSTRUCTION NOTES:
1. ALL TRAILS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND THE "TYPICAL TRAIL CROSS SECTION AND TRAIL CROSS SECTION TYPES "A, B & C" AS SHOWN ON SHEETS 3 & 4, TRAIL ALIGNMENT PLANS 13 THROUGH 34, AND OTHER REQUIREMENTS AND DETAILS ON SHEETS 5 THROUGH 12.

LEGEND
- - - - APPROXIMATE PROPERTY LINE
- - - - EXISTING ROAD
- - - - LESTER RIVER
- - - - PROPOSED TRAILS

EXISTING DATA NOTES:
EXISTING TOPOGRAPHIC INFORMATION IS BASED ON ONE FOOT INTERVAL LIDAR DATA PROVIDED BY ST LOUIS COUNTY THAT WAS FLOWN THE 1ST SPRING OF 2011.
ALL OTHER EXISTING CONDITIONS ARE "TRACED" FROM AERIAL PHOTOGRAPHY. THEY ARE NOT TO BE CONSIDERED ACCURATE AND ARE THERE AS A CONVENIENCE TO THE CONTRACTOR.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS AND NOTIFY OWNER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.

TRAIL AREA LOCATOR MAP

CITY OF DULUTH 1223
DRAWN BY TTP SHEET NO. 2 OF 34
TYPICAL TRAIL DESIGN CROSS-SECTION

VEGETATION CLEARING ZONE REFER TO TRAIL SPECIFICATION
FOR MORE DETAILS. CORRIDOR CLEARING LIMITS VARY BETWEEN
DIFFERENT TRAIL SPECIFICATIONS

TYPICAL TRAIL DESIGN CROSS-SECTION

ADDITIONAL CLEARANCE AS REQUIRED TO ALLOW
FOR GRADING OF BACKSLOPE AREAS

GRADING AREA LIMITED TO
ONLY AS NECESSARY TO
PREPARE DOWNSLOPES AS PER
TYPE A/C TRAIL CROSS-SECTIONS
24" WIDE OF LOW VEGETATION ALONG TRAIL

TRAIL TREAD TYPICALLY
24" TO 48" WIDE (60" MAX)
WITH 5% OUTSLOPE
24" WIDE OF LOW VEGETATION ALONG TRAIL

TYPICAL TRAIL DESIGN NOTES:

1. THE GRAPHIC ON THIS SHEET ILLUSTRATES A TYPICAL TRAIL CROSS-SECTION
HIGHLIGHTING TREAD AND VEGETATION CLEARANCE ZONE WIDTHS.

2. IN SELECT SITUATIONS THE TRAIL WIDTH MAY BE MODIFIED BY THE OWNER'S
REPRESENTATIVE IN RESPONSE TO THE TERRAIN OR TO CREATE A TRAIL
FEATURE.

3. SEE SPECIFICATIONS FOR FURTHER DETAILS ON TREAD AND CORRIDOR
CLEARING AND TYPICAL TRAIL DESIGN CROSS-SECTIONS

4. AFTER APPROVAL OF ROUGH GRADING BY OWNER'S REPRESENTATIVE
CONTRACTOR SHALL FINE GRADE TRAIL CROSS-SLOPE, BACKSLOPES AND
DOWNSLOPES IN ACCORDANCE WITH THE CONTRACT DOCUMENT
REQUIREMENTS.

5. IF DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE EROSION CONTROL
BLANKETS AND/OR COIR ROLLS AS LISTED IN THE BID FORM MAY BE
INCORPORATED IN SELECT LOCATIONS TO FURTHER STABILIZE THE SOILS.
USE OF THESE ITEMS WILL LIKELY BE LIMITED TO AREAS SUBJECT TO EROSION.
(SEE SWPPP STORM WATER POLLUTION PREVENTION PLAN FOR DETAILS).

6. ALL DISTURBED AREAS NOT PART OF ACTIVE TREAD TO BE SEEDED AND
MULCHED WITHIN 7 DAYS OF NOT BEING WORKED. SEE (SWPPP STORM WATER
POLLUTION PREVENTION PLAN FOR DETAILS).

7. SEE SWPPP SPECIFICATIONS FOR SEED MIX DETAILS AND NECESSARY BEST
MANAGEMENT PRACTICES FOR EROSION CONTROL MEASURES.

8. AFTER COMPLETION OF ALL GRADING, THE TRAIL SHOULD BE
MECHANICALLY COMPACTED TO ITS APPROVED WIDTH USING A VIBRATORY
PLATE, SHEEPS FOOT, OR OTHER APPROVED COMPACTOR ONE PASS.

9. CUT BRUSH AND SLASH MUST BE DISPOSED IN AN UPLAND LOCATION AND MUST
BE KEPT OUT OF STREAMS, GULLIES, SWALES, WETLANDS, AND LOW AREAS. SEE
SPECIFICATIONS FOR DETAILS.

10. NO EXCAVATION OR FILL PERMITTED IN WET AREAS. WET AREAS WILL BE
MARKED IN THE FIELD BY THE OWNER. IT IS THE RESPONSIBILITY OF THE
CONTRACTOR TO CONSULT WITH THE OWNER PRIOR TO DOING ANY WORK
WITHIN SUSPECTED WET AREAS.

TRAIL RIDING NOTES:

1. TREE REMOVAL, STUMP REMOVAL, BRUSH REMOVAL, AND LUMB TRIMMING IS
INCLUDED IN THE CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION
TYPES "A, B & C". (SEE SPECIFICATION FOR FURTHER DETAILS)

2. TRAIL TREAD GRADING AND COMPACTING IS INCLUDED IN THE CONTRACTORS
UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATION
FOR FURTHER DETAILS)

3. PUSHING ASIDE ROCKS OR FRACTURED STONE ENCOUNTERED WHILE GRADING
THE TRAIL IS INCLUDED IN THE CONTRACTORS UNIT BID PRICE FOR TRAIL
CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATION FOR FURTHER DETAILS)

4. GRAVING THROUGH LOW SPOTS, EARTHER PILES, MISCELLANEOUS DEBRIS, AND
FALLEN WOODY MATERIALS IS INCLUDED IN THE CONTRACTORS UNIT BID PRICE
FOR TRAIL CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATION FOR FURTHER
DETAILS)

5. ALL TURNS NOT DEFINED AS A BERM OR SWITCHBACK ARE TO BE IN SLOPED
TURNS AS SPECIFIED. INSLOPED TURNS ARE INCLUDED IN THE CONTRACTORS
UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B & C". (SEE
SPECIFICATION FOR FURTHER DETAILS)

6. GRADE REVERSALS ARE REQUIRED AT A MINIMUM EVERY 100 FT. GRADE
REVERSALS ARE INCLUDED IN THE CONTRACTORS UNIT BID PRICE FOR TRAIL
CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATION FOR FURTHER DETAILS)

7. SEED AND MULCH OF NON-TREAD DISTURBED AREAS AS A RESULT OF THE TRAIL
CONSTRUCTION ARE INCLUDED IN THE UNIT BID PRICE FOR TRAIL
CONSTRUCTION TYPES "A, B & C".
CONSTRUCTION NOTE:

PARTIAL BENCH CUT IS ALLOWED WHEN DONE PROPERLY WITH A DOWNHILL RETAINING WALL AND COMPACTED BACKFILL. REFER TO PAGE 159 OF (TRAIL SOLUTIONS). IMBA'S GUIDE TO BUILDING BETTER SINGLETRACK.

MEASUREMENT AND PAYMENTS FOR TRAIL CONSTRUCTION TYPES IS BASED ON THE SLOPE AVERAGES AS DEPICTED IN THE TRAIL ALIGNMENT SECTION OF THIS PLAN SET AND IN THE TRAIL SLOPE ANALYSIS MAP.

FIELD MEASUREMENT NOTES:

1. MEASUREMENT & PAYMENT FOR TRAIL CONSTRUCTION TYPE IS BASED ON AVERAGE SLOPE GRADIENTS AS DEPICTED IN PLANS. GRADING THROUGH UNLEVEL GRADES AND UNDULATIONS IS INCLUDED IN THE CONTRACTORS UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPE "A, B, & C" (SEE SPECIFICATIONS FOR FURTHER DETAILS)

2. TRAIL TYPES AND QUANTITIES ARE PROVIDED AS A CONVENIENCE TO THE CONTRACTOR. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY FIELD QUANTITIES AND NOTIFY OWNER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.

TYPICAL TRAIL CROSS-SECTIONS (A-C TRAIL TYPES)
NOTES:
PLAN SHEETS 13-24 ILLUSTRATE THE CENTER OF A 20 TO 50-FOOT WIDE CORRIDOR FOR TRAIL CONSTRUCTION, WHICH ARE PROVIDED TO ESTABLISH AN OVERALL TRAIL LAYOUT PLAN AND TO ESTIMATE OVERALL LINEAR FEET OF TRAIL. TO ENSURE PROPER ALIGNMENT AND TO ACCOMMODATE SITE NUA NCES, THE ACTUAL ALIGNMENT OF THE TRAIL WITHIN THESE CORRIDORS WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE POINT OF CONSTRUCTION, AS THE FOLLOWING GRAPHIC ILLUSTRATES.

ST LOUIS COUNTY PERMITS A 20-FOOT WIDE CORRIDOR IF THE ALIGNMENT OF THE TRAIL NEEDS TO GO BEYOND THE 20-FOOT CORRIDOR, 10 FEET ON EITHER SIDE OF THE CENTERLINE. THIS ALLOCATION MUST BE APPROVED BY THE ST LOUIS COUNTY FOREST RECREATION SPECIALIST.

THE 50-FOOT WIDE CORRIDOR ALIGNMENT IS THE CITY OF DULUTH'S CORRIDOR REQUIREMENTS, 25 FEET ON EITHER SIDE OF THE CENTERLINE. ALIGNMENT OUTSIDE OF THIS CORRIDOR MUST BE APPROVED BY THE CITY OF DULUTH TRAILS COORDINATOR.

SEE SHEET 2 FOR APPROXIMATE LOCATION FOR CITY, COUNTY AND PRIVATE LANDS.

ACTUAL FIELD FLAGGED TRAIL ALIGNMENT WILL BE ADJUSTED IN RESPONSE TO SITE NUA NCES, TOPOGRAPHY, AND DESIRED TRAIL FLOW.

20'-50' WIDE TRAIL CORRIDOR (CONTRACTOR TO STAY WITHIN CORRIDOR BOUNDARIES UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE)

CENTER-LINE OF FIELD FLAGGED TRAIL ALIGNMENT AS SHOWN ON PLAN SHEETS

TRAIL LAYOUT AND FIELD LAYOUT REQUIREMENTS
NOT TO SCALE

Field Alignment Protocol:
The actual trail layout and alignment will be determined in the field using the following protocol:

1. Owner's Representative shall "rough" flag the trail within each trail corridor shown on the plan sheets to establish the initial alignment prior to construction. Note that trail corridors may change as determined by Owner's Representative as warranted by site conditions.

2. Owner's Representative and Contractor shall jointly refine the trail alignment with flagging and/or pin stakes in the field consistent with sustainable design standards provided in these contract documents or otherwise stipulated. The slope gradient of the existing site condition for a trail shall be determined prior to trail construction.

   - The angle of the existing side slope shall be determined by referring to the plan set and the average Slope Gradient Map found in the specifications.
   - Measurement of trail tread length and determination of linear feet of each trail type to be constructed shall be made by the Owner's Representative and Contractor prior to construction.
   - The Owner's Representative shall prepare a document verifying trail types and quantities to be constructed.
   - Owner's Representative and Contractor shall sign the document indicating agreement with quantities and types of trails to be constructed.
   - Important Contract Requirement: Contractor's lead person/field manager shall have completed at least 40 hours of professional trail building training as approved by the Owner's Representative and as provided by a current member of the Professional Trail Builders' Association or the International Mountain Bike Association prior to start of construction and will need to provide proof of program completion.

3. Contractor shall undertake initial contour brushing based on flagged trail alignment to establish visible trail corridor.

4. Owner's Representative and Contractor shall walk trail alignment and make any final adjustments prior to rough grading of trail. (Only if necessary after brushing, as determined by Owner's Representative)

5. Owner's Representative and/or Contractor overturns and rakes existing field if the field alignment using techniques as outlined in the contract documents.

6. Owner's Representative and Contractor walk rough graded trail to ensure conformance with sustainable design standards provided in these contract documents or otherwise stipulated.

7. Contractor completes trail finish grading and detail work in accordance with contract documents, including cutting and smoothing the bankside, outsloping the tread, compacting the tread, and completing other finish work.

8. Owner's Representative and Contractor walk trail corridor for preliminary field inspection and approval, including final determination of trail features and linear feet of trail that was constructed to establish basis for payment.

9. Contractor completes final trail work in accordance with contract documents.

10. Owner's Representative and Contractor walk trail corridor for final field inspection and approval.

City of Duluth Project No. 1223
Drawn by: TTP
Sheet No. 5 of 34
TRAIL TREAD ROCK ARMORING AND SIDESLOPE ARMORING DETAIL

NOT TO SCALE

WOOD FIBER BLANKET DETAIL

ANCHOR TRENCH SECTION DETAIL

COIR ROLL DETAIL
NOT TO SCALE
PAYMENT NOTE:
PAYMENT FOR BERMED TURNS WILL BE ON A LINEAL FOOT BASIS. FOR CONSTRUCTED TURNS PAYMENT WILL BE ON A PER UNIT BASIS. IN CASES WHERE TRAIL IS ROUTED WHERE AN EXISTING EMBANKMENT OR SIDE HILL IS USED FOR A TURN, NO EXTRA PAYMENT WILL BE PROVIDED.

TURN LENGTH IS MEASURED AT THE POINT ON EACH END OF THE TURN WHERE THE HEIGHT EXCEEDS 12" ABOVE THE BYPASS TRAIL GRADE.

SEED AND MULCH ARE INCLUDED IN THE UNIT BID PRICE FOR TURNS.

NOTES:
1. ACTUAL TURN SIZES AND LENGTHS WILL BE DETERMINED IN THE FIELD BY THE OWNERS REPRESENTATIVE AND WILL BE BASED ON TRAIL TYPE SPECIFICATIONS.
2. TURNS SHALL BE BLENDED INTO THE EXISTING TOPOGRAPHIC FEATURES OF THE SITE.
3. TURN LENGTH AND RADIUS VARY AND WILL BE REVIEWED AND APPROVED BY THE OWNERS REPRESENTATIVE IN THE FIELD.
4. PROPER DRAINAGE OF THE INCOMING AND OUTGOING TRAIL TREAD AND THE INSIDE OF A TURN IS ESSENTIAL. CAREFUL ATTENTION MUST BE PAID TO ENSURE POSITIVE DRAINAGE AWAY FROM THE TURN. A TURN WILL NOT BE APPROVED FOR PAYMENT UNTIL THE OWNERS REPRESENTATIVE HAS APPROVED THE TURN BERM FOR PROPER DRAINAGE.
5. GRADE DFS BEFORE AND AFTER TURNS ARE INCLUDED IN THE UNIT BID PRICE.

FILL USED FOR TURNS SHALL BE COMPACTED IN MAXIMUM 6" LIFTS

BACKSLOPE SLOPED 3:1 OR LESS TO DRAIN AWAY FROM TURN

BERMED TURN & CONSTRUCTED TURN DETAIL
NOT TO SCALE
**TRAIL MARKER DETAIL (BY OWNER) (24 REQUIRED)**

NOT TO SCALE

- **Concrete Base Detail**
  - 3' x 3' x 3' Base
  - 3" Grade
  - 1" Avg. Compaction
  - 2" Minimum Wash
  - 18" Minimum Thick Fiber Reinforced Concrete
  - #5 Bar or Larger
  - 8" Mix DOT 3138 Class 5 Aggregate Base
  - Compacted Subgrade
  - (4) 12" Long Threaded 5/8" J Bolts & Base Plate (Per Manufacturer)
  - Light Broom Finish
  - Sloped to Drain
  - 2% Minimum Wash
  - 18" Minimum Thick Fiber Reinforced Concrete
  - #5 Bar or Larger
  - 8" Mix DOT 3138 Class 5 Aggregate Base
  - Compacted Subgrade

**MANUFACTURER CONTACT INFORMATION:**

Iron Rangers, LLC
5006 N Burns Rd
Spokane Valley, WA 99216
PH: 1-800-262-3322
FAX: 1-509-339-5438

**IRON RANGER FEE COLLECTION SPECIFICATIONS:**

- Model: FS636 Shell / FS636 Insert Series
- Option: EB-1 Empty Envelope Box
- Color: Martin Brown Powder Coated Finish

**INSTALLATION:**

- Install Per Manufacturer Recommendations in Concrete Base.

**IRON RANGER PAY STATION (1 REQUIRED)**

NOT TO SCALE

** Examples of Trail Marker **

**Examples of Trail Marker**

**Manufacturers Contact Information:**

Rhino, A Division of Repetek, Inc.
280 University Drive SE
Rochester, MN 55903
PH: 1-651-522-4404
FAX: 1-651-522-4443

**Driver Types:**

Two Types Are Available

Depending on the Soil Conditions, Type of Driver Will Be Determined in Field at the Direction of the Contractor and Owner's Representative

- FG-44 Driver - Low-Angle Pneumatic Driver - Hard or Rocky Soil
- FG-44 Driver - Low-Angle Pneumatic Driver - Compacted Subgrade

**Driver Details:**

- FG-44 FG-44
- FG-44 FG-44
CUSTOM CUT STRINGERS AND END DECK BOARD TO FIT ADJACENT TO EXISTING BOULDER WITH MINIMUM GAP

EXISTING LARGE BOULDER

STACKED 6X6 PIER

BOARDWALK CROSSING ABUTTING TO BOULDER

ATTACH BEAM TO MID POST AND SLEEPERS WITH (2) 7" LONG X 3/4" DIA. LAG SCREWS - COUNTERBORE SO HEAD IS FLUSH WITH BEAM

ATTACH WITH 7" LONG RING-SHANKED SPIKES

ATTACH WITH 7" LONG RING-SHANKED SPIKES

WOOD SKILLS "BEAM" & "PLANK" DETAILS

NOT TO SCALE