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 SHEET 4, TRAIL ALIGNMENT PLANS 16 THROUGH 43, AND OTHER REQUIREMENTS AND UTLS AS ON SHEETS 3 THROUGH 15.

LEGEND:

EXISTING ROAD
EXISTING HIKING TRAIL
EXISTING SNOWMOBILE TRAIL
MISSION CREEK
INTERSECTION MARKER
TRAIL SEGMENT MARKER
PROPOSED TRAILS
FUTURE TRAILS (NOT IN CONTRACT)

EXISTING DATA NOTES:

EXISTING TOPOGRAPHIC INFORMATION IS BASED ON ONE FOOT INTERVAL LASER DATA PROVIDED BY ST. LOUIS COUNTY THAT WAS FLOWN THE FALL OF 2011.

ALL OTHER EXISTING CONDITIONS ARE "TRACED" FROM AERIAL PHOTOGRAPHY. THEY ARE NOT TO BE CONSIDERED ACCURATE AND ARE PROVIDED 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.

THROUGHOUT THE MISSION CREEK PARK LANDSLIDE AREAS MAY BE ENCOUNTERED DURING THE CONSTRUCTION OF THE TRAIL SEGMENTS DUE TO THE JUNE 2013 FLOOD. THESE LANDSLIDE AREAS ARE NOT IDENTIFIED OR REPRESENTED IN THE LASER TOPOGRAPHIC DATA FOUND IN THESE CONSTRUCTION DOCUMENTS BECAUSE THAT DATA WAS CREATED PRIOR TO THE FLOOD. WHEN PROPOSED TRAIL SEGMENTS ARE ENCOUNTERED IN LANDSLIDE AREAS CONSULT WITH THE OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.

DISCRETIONARY EROSION CONTROL BMP MEASURES MAY NEED TO BE IMPLEMENTED AND WILL BE PAID BASED ON THE CONTRACTORS UNIT BID PRICE.

RIVER SIDE TRAIL:
TRAIL SEGMENT 5 = BLUE BUMP PUMP (1 WAY)
GROSS LENGTH SUMMARY: 13,194 LF (2.5 MILES)

HILL SIDE TRAIL:
TRAIL SEGMENT 1, 2, 3, & 4 = GREEN TRADITIONAL (2 WAY)
GROSS LENGTH SUMMARY: 18,240 LF (3.5 MILES)

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

LOCATOR MAP - HILL SIDE TRAIL (SHEETS 16-43)

CULTURALLY SENSITIVE AREA NO CONSTRUCTION ALLOWED WITHIN BOUNDARY (KEEP OUT)
VEGETATION CLEARING ZONE
REFER TO TRAIL SPECIFICATION
FOR MORE DETAILS. CORRIDOR
CLEARING LIMITS VARIES BETWEEN
DIFFERENT TRAIL SPECIFICATIONS

TYPICAL TRAIL DESIGN CROSS-SECTION

24" WIDE OF LOW VEGETATION ALONG TRAIL

NOT TO SCALE

ADDITIONAL CLEARANCE
AS REQUIRED TO ALLOW
FOR GRADING OF
BASKOLES AREAS

VARIES

VARIES

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

24" TO 48" WIDE (60" MAX)
WITH 5% OUTSLOPE

TYPICAL TRAIL TREAD TYPICALLY
24" TO 48" WIDE (60" MAX)
WITH 5% OUTSLOPE

TYPICAL TRAIL DESIGN CROSS-SECTION

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 OWNERS REPRESENTATIVE CONTRACTOR SHALL FINE GRADE TRAIL CROSS-SLOPE, BASKOLES 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 FOR FURTHER 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 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 TREAD SHALL 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.

TYPICAL TRAIL DESIGN CROSS-SECTION

1. TRAIL REMOVAL, STUMP REMOVAL, BRUSH REMOVAL, AND LIMB 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 CONTRACTOR'S 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 CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B, & C." (SEE SPECIFICATIONS FOR FURTHER DETAILS)

4. GRADE REVERSALS ARE REQUIRED AT A MINIMUM EVERY 100 FT. GRADE REVERSALS ARE INCLUDED IN THE CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B, & C." (SEE SPECIFICATIONS FOR FURTHER DETAILS)

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

6. 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 158 OF (TRADE SOLUTIONS: IMBA'S GUIDE TO BUILDING BETTER SINGLETACK).

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 UNEVEN GRADINGS AND UNDULATIONS IS INCLUDED IN THE CONTRACTOR'S 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)
Field Alignment Protocol:
The actual trail layout and alignment will be determined in the field using the following protocol:

1. Owner's Representative shall pin and/or hang flags of sufficient density to communicate intent to construction team(s) within each trail corridor shown on the plan sheets to establish the trail alignment prior to construction. Note that trail corridors may change as determined by Owner's Representative as warranted by site conditions.

2. The angle of the existing side slopes shall be determined by referring to this plan set and the "Average Slope Gradient Map" found in the specifications.
   - 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 Builder's 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 corridor brushing based on flagged trail alignment to establish visible trail corridor.

4. Upon completion of pin flagging and/or hanging flagging the Owner's Representative and Contractor shall walk trail alignment to establish an understanding of design intent and expectations, and make any final adjustments prior to rough grading of trail. (Only if necessary after brushing, as determined by Owner's Representative.)

5. Contractor undertakes rough grading of trail following pin flagging and/or hanging flagging of the final trail alignment using techniques as defined 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 final finish grading and detail work in accordance with contract documents, including cutting and rounding the backslope, sealing 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 final feet of trail that was constructed to establish base for payment.

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

10. Owner's Representative and Contractor walk and/or ride completed trail for final field inspection and approval.
TRAIL TREAD ROCK ARMORING AND SIDESLOPE ARMORING DETAIL

NOT TO SCALE

ENSURE THAT THE EROSION CONTROL BLANKETS ARE IN DIRECT CONTACT WITH THE SOIL BENEATH THEM AND SECURELY ATTACHED WITH 11 GAUGE STAPLES ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION.

ANCHOR TRENCH SECTION DETAIL

WOOD FIBER Blanket DETAIL

NOT TO SCALE

ANCHOR TRENCH TO BE USED AT TOP OF ALL SLOPES AND EVERY 500 LINEAL FEET OF SLOPE. THE EROSION CONTROL BLANKET SHALL BE PLACED IN A ONE-TRENCH, STAPLED IN PLACE AND BACKFILLED WITH SOIL AND COMPACTED - BLANKET SHALL BE OVERLAPPED A MINIMUM OF 6" AS SHOWN ABOVE THE BLANKET AND SECURED IT WITH STAPLES.

100% COIR FIBER ROLLS A MINIMUM OF 6" DIAMETER, BOUND BY HIGH STRENGTH 2" TWISTED COIR NETTING - ROLLS SHALL BE PLACED PERPENDICULAR TO THE FLOW OF WATER AND SHALL BE IN DIRECT CONTACT WITH THE SOIL AND SECURELY STAKED IN PLACE.

COIR ROLL DETAIL

NOT TO SCALE

COIR ROLLS SHALL EXTEND FAR ENOUGH UP THE SIDES OF THE SLOPE TO ENSURE THE WATER DOES NOT FLOW AROUND THE SIDES OF THE ROLL.

CITY OF DULUTH PROJECT NO. 1224 DRAWN BY: TTP SHEET NO. 6 OF 43
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 OWNER'S REPRESENTATIVE IN THE FIELD.
4. PROPER DRAINAGE OF THE INCOMING AND OUTGOING TRAIL 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 OWNER'S REPRESENTATIVE HAS APPROVED THE TURN Berm FOR PROPER DRAINAGE.
5. GRADE DIPS BEFORE AND AFTER TURNS ARE INCLUDED IN THE UNIT BID PRICE.

BERMED TURN & CONSTRUCTED TURN DETAIL

NOT TO SCALE
TRAIL MARKER DETAIL (BY OWNER)

3'-0" x 3'-0" SQUARE

CONCRETE BASE DETAIL

MANUFACTURER CONTACT INFORMATION:
Iron Rangers, LLC
5039 N Burns RD
Spokane Valley, WA 99216
PH: 1-800-262-3322
FAX: 1-509-328-5438

IRON RANGER FEE
COLLECTION SPECIFICATIONS:
Model: FS036 Sheet / FS036 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 IN BASE BID)

EXAMPLE OF FEE STATION
DETAIL NOTES:

1. LUMBER SHALL BE ROUGH SAWN RED PINE #2 OR APPROVED EQUAL, SIZED TO THE FULL DIMENSIONS SHOWN ON THE PLANS UNLESS NOTED OTHERWISE. ALL LUMBER SHALL BE ROT-RESISTANT TREATED ACCORDING TO THE OPTIONS INDICATED IN THE SPECIFICATIONS.

2. ROT-RESISTANT TREATMENTS OTHER THAN THOSE LISTED MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO BIDDING.

3. LEVELING GRADE BEAMS SHALL BE SHIMMED AS NECESSARY TO MEET DESIRED PITCH OF STRUCTURE.

4. PRESERVE LUMBER IN ACCORDANCE WITH THE SPECIFICATIONS.

5. SELECT FASTENERS AND HARDWARE IN ACCORDANCE WITH THE SPECIFICATIONS.

6. SEE SPECIFICATIONS FOR FINISHED TRAIL CONSTRUCTION DETAILS.

7. SEE SPECIFICATIONS FOR UNIT DEFINITIONS AND TREAD CONSTRUCTION DETAIL DRAWINGS.

8. IN INSTANCES WHERE SITE CONDITIONS PRECLUDE DEVELOPMENT OF THE TRAIL FOLLOWING THE PROPOSED ALIGNMENT, THE TRAIL WILL BE REROUTED AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

9. SIZES, LENGTHS AND EXTENT OF ALL BOARDWALKS, ROCK HARDENED TREAD, BRIDGES AND BEAMS TO FIELD FIT AT TIME OF CONSTRUCTION.

10. BOARDWALK & BRIDGE CONSTRUCTION LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE TIME OF CONSTRUCTION.

11. 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.

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

13. 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.

14. WOOD RAMPS OR STONE PITCHING MAY BE REQUIRED BEFORE AND AFTER BRIDGES AND BOARDWALKS. APPLICATION WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE TIME OF CONSTRUCTION. PAYMENT FOR RAMPS WILL BE ADDED TO THE TOTAL LENGTH OF THE BOARDWALK AND PAYMENT FOR STONE PITCHING WILL BE PER THE UNIT BASE PRICE OF ROCK/ARMORING.

TYPICAL ELEVATION DETAIL FOR BRIDGE (CREEK CROSSINGS)

- 16'-0" MAXIMUM SPAN AT 16'-0" O.C. FOR 2X12 STRINGERS
- 2X12 HEADER ATTACHED WITH 4'-0" LONG DECK SCREWS
- 2X12 HEADER AT RAMP AND BOARDWALK ATTACHED WITH 4'-0" LONG DECK SCREWS

TYPICAL PLAN DETAIL FOR BRIDGE (CREEK CROSSINGS)

- 16'-0" MAXIMUM SPAN AT 16'-0" O.C. FOR 2X12 STRINGERS
- 2X6 DECK BOARDS
- 2X12 STRINGERS
- 6X6 TIMBERS
- 2X6 CROSS BRACE - ATTACH TO PIERS WITH 3/8" DIA. X 8" LONG LAG SCREW (4 PER BRACE)
- 4'-0" LONG 6X6 LEVELING GRADE BEAM
- 1/2" DIA. PRE-DRILLED HOLE AND #4 REBAR WASHED WELDED TO TOP AND DRIVEN TO A DEPTH OF 36"
1. LUMBER SHALL BE ROUGH SAWN RED PINE #2 OR APPROVED EQUAL, SIZED TO THE FULL DIMENSIONS SHOWN ON THE PLANS UNLESS NOTED OTHERWISE. ALL LUMBER SHALL BE ROT-RESISTANT TREATED ACCORDING TO THE OPTIONS INDICATED IN THE SPECIFICATIONS.

2. ROT-RESISTANT TREATMENTS OTHER THAN THOSE LISTED MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO BIDDING.

3. LEVELING GRADE BEAMS SHALL BE SHIMMED AS NECESSARY TO MEET DESIRED PITCH OF STRUCTURE.

4. PRESERVE LUMBER IN ACCORDANCE WITH THE SPECIFICATIONS.

5. SELECT FASTENERS AND HARDWARE IN ACCORDANCE WITH THE SPECIFICATIONS.

6. SEE SPECIFICATIONS FOR FINISHED TRAIL CONSTRUCTION DETAILS.

7. SEE SPECIFICATIONS FOR UNFINISHED TRAIL CONSTRUCTION DETAIL DRAWINGS.

8. IN CASES WHERE SITE CONDITIONS PRECLUDE DEVELOPMENT OF THE TRAIL FOLLOWING THE PROPOSED ALIGNMENT, THE TRAIL WILL BE RETURND TO THE OWNER'S REPRESENTATIVE.

9. SIZES, LENGTHS AND EXTENT OF ALL BOARDWALKS, ROCK HARDENED TREAD, BRIDGES AND BEARMS TO BE FIELD FIT AT TIME OF CONSTRUCTION.

10. BOARDWALK & BRIDGE CONSTRUCTION LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE TIME OF CONSTRUCTION.

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

12. CUT BRUSH AND BLASH MUST BE DISPOSED IN UPLAND LOCATION AND MUST BE KEPT OUT OF STREAM, GULLIES, SiWLES, WETLANDS, AND LOW AREAS. SEE SPECIFICATIONS FOR DETAILS.

13. NO ECAVATION 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.
180 LF BRIDGE, W/OUT RAILING (THIS BRIDGE IS REQUIRED BY THE DNR AND MUST BE INSTALLED PER BRIDGE DETAIL ON PAGE 14)