

# CITY OF DULUTH

## DEPARTMENT OF PUBLIC WORKS AND UTILITIES ENGINEERING DIVISION

### PLAN SYMBOLS

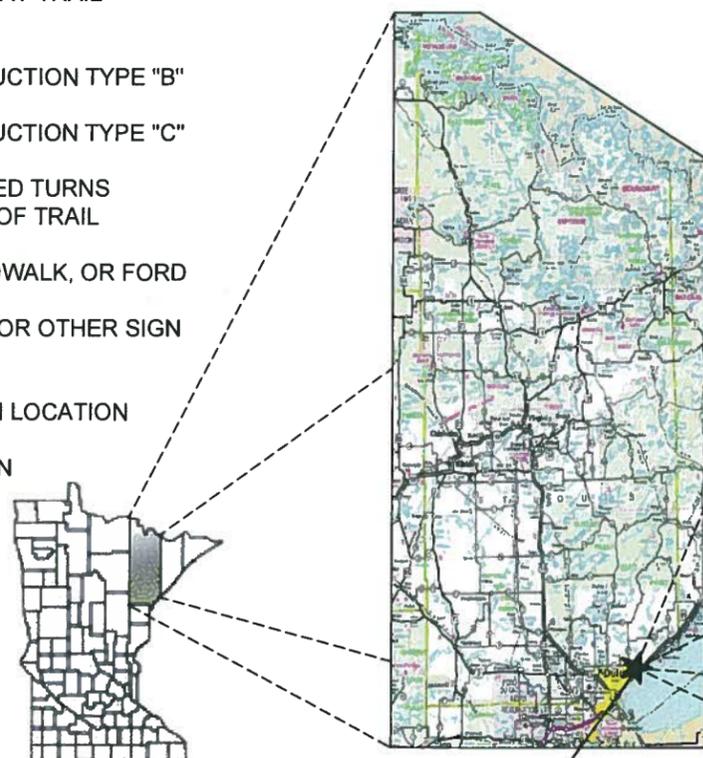
-  PROPERTY LINES
-  EXISTING CONTOUR LINES
-  TRAIL CONSTRUCTION TYPE "A" CENTER LINE OF PROPOSED 2-WAY TRAIL CORRIDOR
-  TRAIL CONSTRUCTION TYPE "A" CENTER LINE OF PROPOSED 1-WAY TRAIL CORRIDOR
-  TRAIL CONSTRUCTION TYPE "B"
-  TRAIL CONSTRUCTION TYPE "C"
-  FORMED BERMED TURNS ALONG EDGES OF TRAIL
-  BRIDGE, BOARDWALK, OR FORD
-  TRAIL MARKER OR OTHER SIGN LOCATION
-  TRAIL MAP SIGN LOCATION
-  KIOSK LOCATION

### CONSTRUCTION PLANS FOR: DULUTH TRAVERSE TRAIL - PHASE 1 LESTER PARK

CITY PROJECT NO. 1223

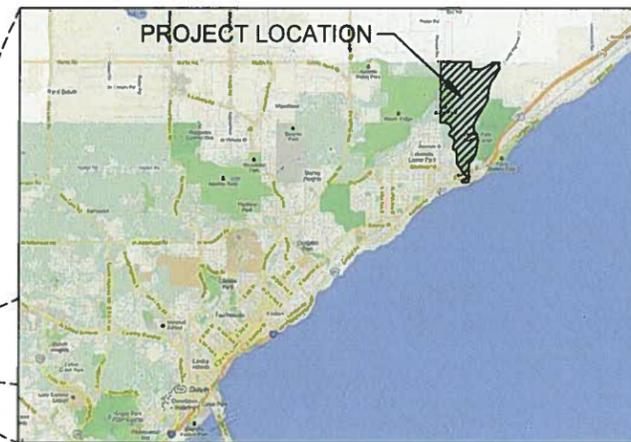


**LENGTH SUMMARY:**  
GROSS LENGTH: ±18,170 LF (±3.5 MILES)



PROJECT LOCATION MAP

NOT TO SCALE



KEY PLAN

NOT TO SCALE

**GOVERNING SPECIFICATIONS**  
THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.  
AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2360 PLANT MIXED ASPHALT PAVEMENT COMBINED 2360/2350 (GYRATORY/MARSHALL DESIGN) SPECIFICATION DATED 1/23/2013 SHALL APPLY.  
AVAILABLE AT: <http://www.dot.state.mn.us/materials/bituminous.html>

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MN MUTCD, INCLUDING THE FIELD MANUAL DATED FEBRUARY 2011.  
AVAILABLE AT: <http://www.dot.state.mn.us/trafficeng/publ/fieldmanual2011/index.html>

THE 2013 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY. COGGS/IMBA TRAIL SPECIFICATION SHALL BE THE GOVERNING SPECIFICATIONS.

SHEET NO.	INDEX
1	TITLE SHEET & INDEX MAP
2	TRAIL AREA LOCATOR MAP
3	TYPICAL TRAIL CROSS SECTION
4	TYPICAL TRAIL CROSS SECTIONS (TYPES A-C)
5	TRAIL ALIGNMENT DETAILS
6	SWPPP DETAILS
7-8	TRAIL FEATURE DETAILS
9	TRAIL SIGNAGE DETAILS (BY OWNER)
10-12	WOOD - TRAIL FEATURE DETAILS
13-34	TRAIL PLANS

THIS PLAN CONTAINS 34 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

JAMES M. SHOBERG  
LANDSCAPE ARCHITECT (TYPED OR PRINTED NAME)  
  
LANDSCAPE ARCHITECT      5-7-13      45577  
DATE      REG. NO.

CITY APPROVAL

 5/7/13  
APPROVED      CHIEF ENGINEER OF TRANSPORTATION      DATE

 5/7/13  
APPROVED      CHIEF ENGINEER OF UTILITIES      DATE

 5/7/13  
APPROVED      CITY ENGINEER      DATE

  
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### DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1 DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

DRAWN BY: TTP

REVISIONS:

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JAMES M. SHOBERG      45577  
LANDSCAPE ARCHITECT      REG. NO.

### COVER

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

**WARNING:**  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

CITY OF DULUTH PROJECT NO. 1223

DRAWN BY: TTP

SHEET NO. 1 OF 34

1



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 INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION

**DULUTH TRAVERSE TRAIL**  
**LESTER PARK**  
**PHASE 1**  
 DULUTH, MINNESOTA

PROJECT NO.: 12-039  
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 LANDSCAPE ARCHITECT REG. NO.

**TRAIL AREA LOCATOR MAP**

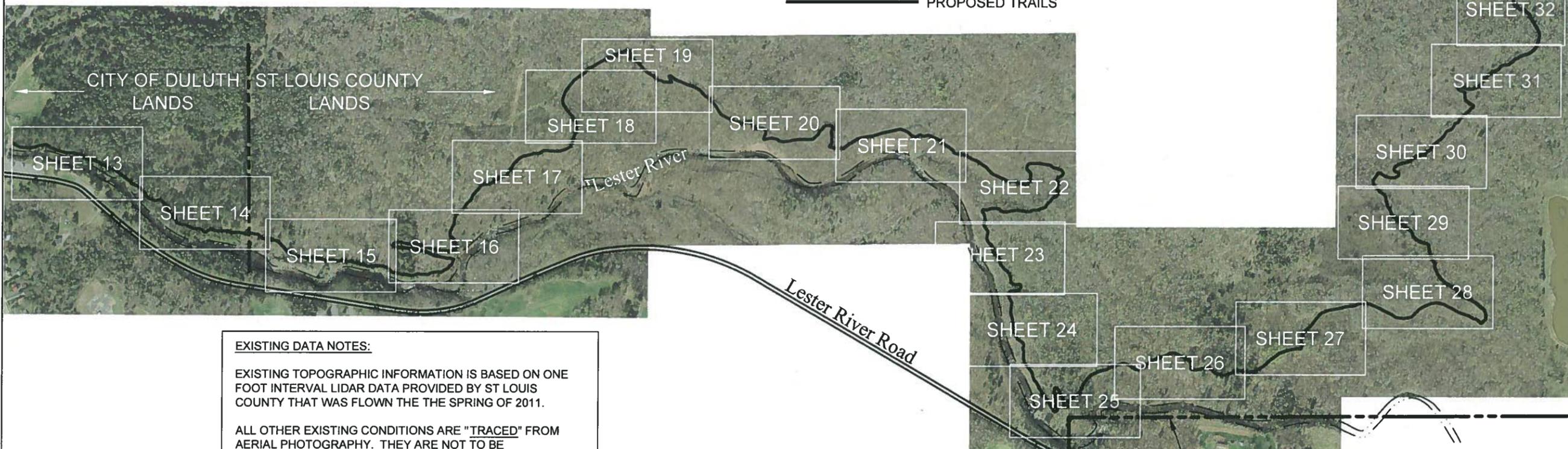
2

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

**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.

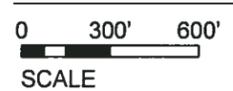
- LEGEND**
- APPROXIMATE PROPERTY LINE
  - ==== EXISTING ROAD
  - . . . - LESTER RIVER
  - PROPOSED TRAILS



**EXISTING DATA NOTES:**  
 EXISTING TOPOGRAPHIC INFORMATION IS BASED ON ONE FOOT INTERVAL LIDAR DATA PROVIDED BY ST LOUIS COUNTY THAT WAS FLOWN THE THE 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.

APPROXIMATE PROPERTY LIMITS CONTRACTOR TO STAY WITHIN PROPERTY

**TRAIL AREA LOCATOR MAP**





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INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION

**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**

DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

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JAMES M. SROBERG 45577  
LANDSCAPE ARCHITECT REG. NO.

**TYPICAL TRAIL CROSS SECTION**

**3**

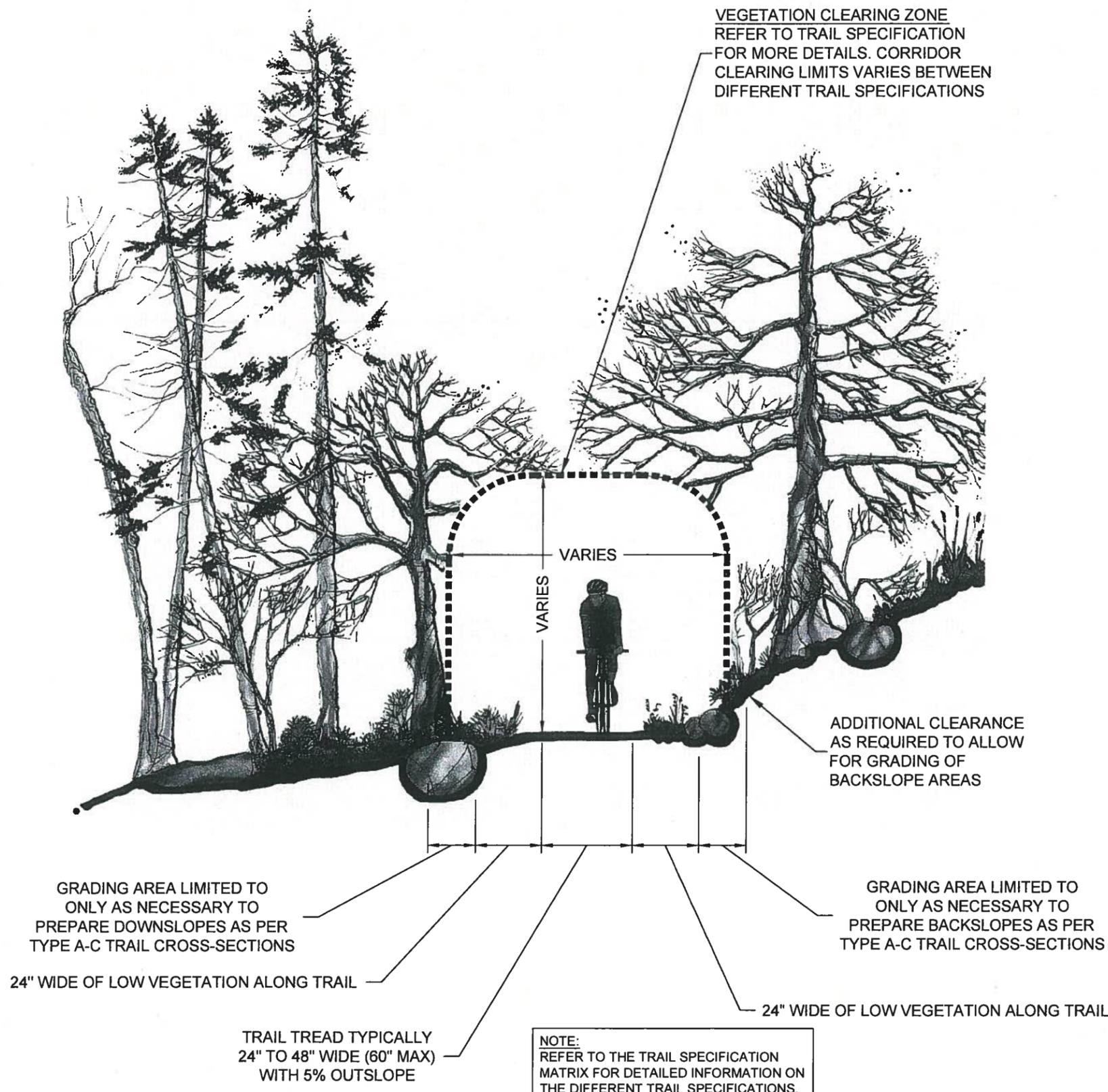
TYPICAL TRAIL DESIGN NOTES:

1. THE GRAPHIC ON THIS SHEET ILLUSTRATES A TYPICAL TRAIL CROSS-SECTION HIGHLIGHTING TREAD AND VEGETATION CLEARANCE ZONE WIDTHS.
2. IN SELECT SITUATION 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 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 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 TREAD SHALL BE MECHANICALLY COMPACTED TO ITS APPROVED WIDTH USING A VIBRATORY PLATE, SHEEP'S 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 BIDDING NOTES:

1. TREE 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 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 CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATIONS FOR FURTHER DETAILS)
4. GRADING THROUGH LOW SPOTS, EARTHEN PILES, MISCELLANEOUS DEBRIS, AND FALLEN WOODY MATERIALS IS 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. GRADE REVERSALS ARE REQUIRED AT A MINIMUM EVERY 100 LF. GRADE REVERSALS ARE INCLUDED IN THE CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES "A, B & C". (SEE SPECIFICATIONS 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".

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



NOTE:  
REFER TO THE TRAIL SPECIFICATION MATRIX FOR DETAILED INFORMATION ON THE DIFFERENT TRAIL SPECIFICATIONS.

**TYPICAL TRAIL DESIGN CROSS-SECTION**

NOT TO SCALE

1/3



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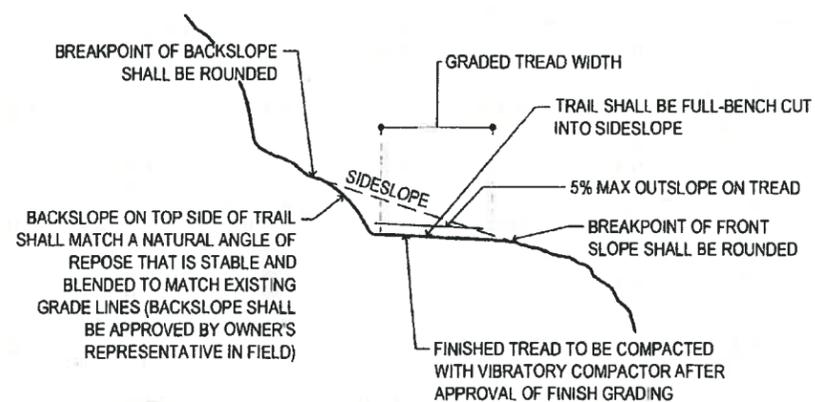
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TYPICAL TRAIL CROSS SECTIONS (TYPES A-C)

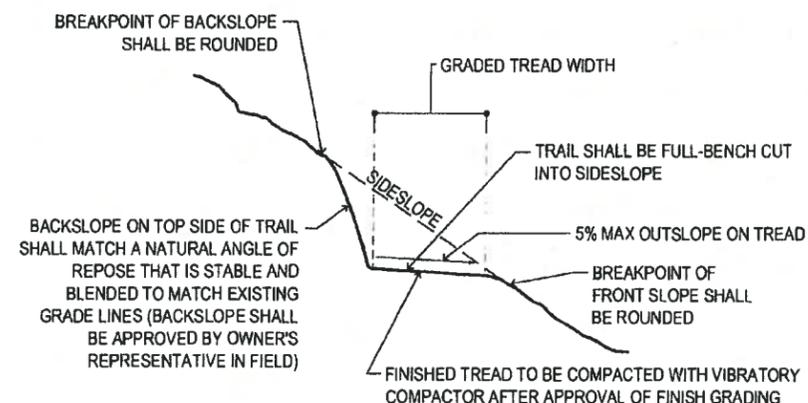
**CONSTRUCTION NOTE:**

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).

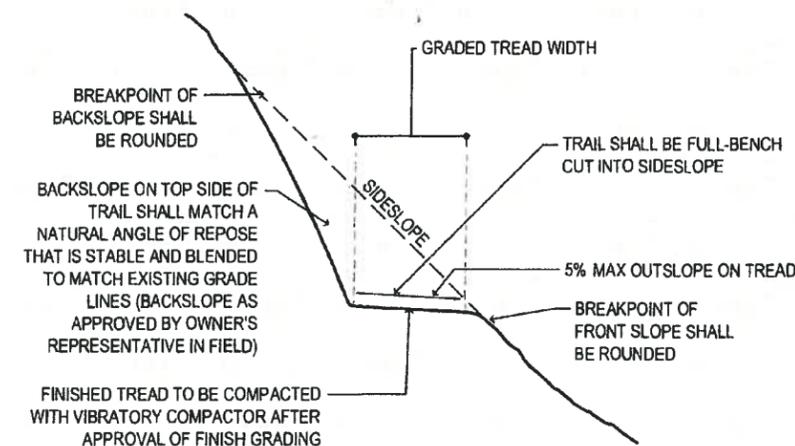
MEASUREMENT AND PAYMENTS FOR TRAIL CONSTRUCTION TYPES IS BASED ON THE SLOPE AVERAGES AS DEPICTED IN THE TRAIL ALIGNMENT SECTION OF THIS PLAN SET AND IN THE TRAIL SLOPE ANALYSIS MAP.



TYPE "A" TRAIL 0%-15% SIDESLOPE



TYPE "B" TRAIL 16%-60% SIDESLOPE



TYPE "C" TRAIL 61+% SIDESLOPE

**FIELD MEASUREMENT NOTES:**

1. MEASUREMENT & PAYMENT FOR TRAIL CONSTRUCTION TYPE IS BASED ON AVERAGE SLOPE GRADIENTS AS DEPICTED IN PLANS. GRADING THROUGH UNEVEN GRADES 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)**

NOT TO SCALE

1/4

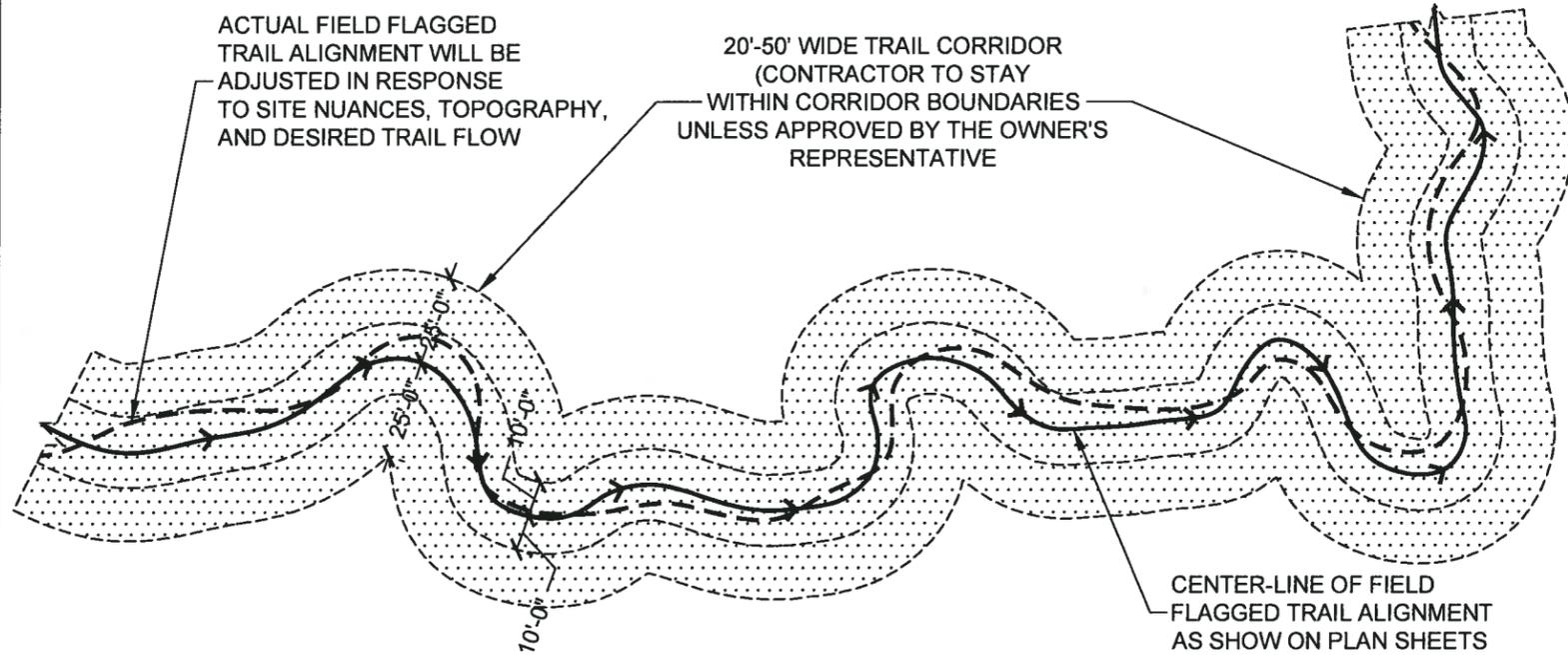
**NOTES:**

PLAN SHEETS 13-34 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 LINEAL FEET OF TRAIL. TO ENSURE PROPER ALIGNMENT AND TO ACCOMMODATE SITE NUANCES, 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, THE NEW ALIGNMENT 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.



**TRAIL LAYOUT AND FIELD LAYOUT REQUIREMENTS**

NOT TO SCALE

1/5

**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 this plan set and the average Slope Gradient Map found in the specifications.
  - Measurement of trail tread length and determination of lineal 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 Builder's Association or the International Mountain Bike Association prior to start of construction and will need to provide proof of program completion.
  - Note that the Contractor's in-field project manager is required to participate in detail flagging of the trail in concert with Owner's Representatives to ensure a clear understanding of design intent, proper drainage, trail building technical issues, and expected outcomes.
3. Contractor shall undertake initial corridor 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. Contractor undertakes rough grading of trail following flagged 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 trail finish grading and detail work in accordance with contract documents, including cutting and rounding the backslope, 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 lineal 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 and/or ride completed trail for final field inspection and approval.



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DULUTH, MINNESOTA

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DRAWN BY: TTP

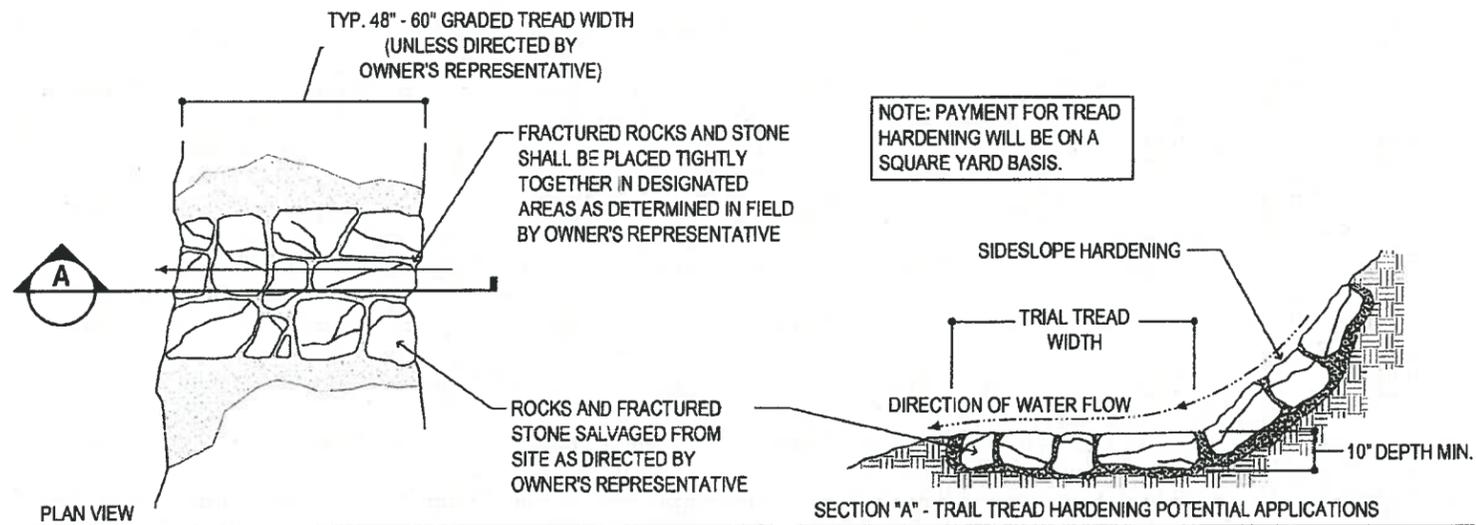
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**TRAIL ALIGNMENT DETAILS**

**5**



EXAMPLE IMAGE OF TRAIL TREAD HARDENING

**CONSTRUCTION NOTE:**  
 BACKFILL BEDDING MATERIAL SHALL BE 3"- 6" OF 3/4" - CRUSHED ROCK. THE SAME CRUSHED ROCK CAN BE UTILIZED FOR FILL BETWEEN THE SET ROCK/STONE.  
 10" MINIMUM ROCK/STONE SET DEPTH.  
 SEAMS RUNNING IN THE DIRECTION OF TRAVEL SHALL BE MINIMIZED IN BOTH LENGTH AND WIDTH. SEAM WIDTH SHALL BE MINIMIZED AND SEAM STAGGERING SHALL BE USED WHERE POSSIBLE.  
 EXTENT OF ARMORING WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE.

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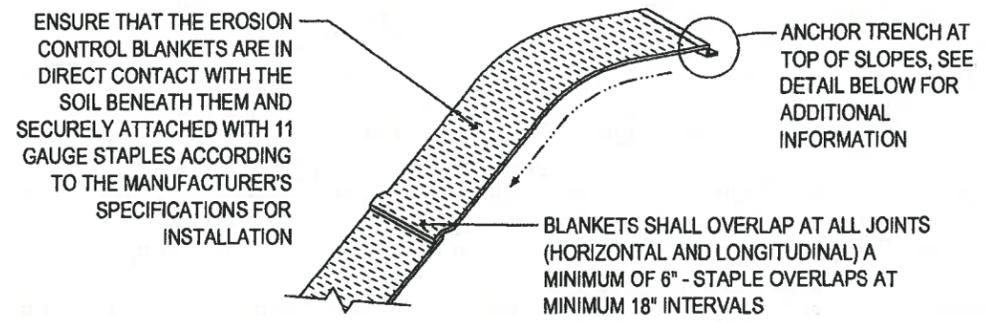
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 LANDSCAPE ARCHITECT REG. NO. 45577

**SWPPP DETAILS**

**TRAIL TREAD ROCK ARMORING AND SIDESLOPE ARMORING DETAIL**

NOT TO SCALE

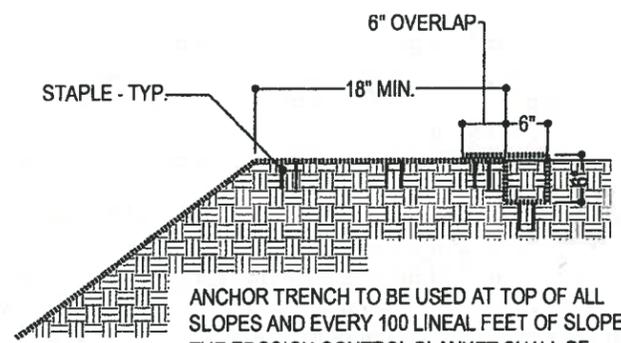
1/6



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 AT TOP OF SLOPES, SEE DETAIL BELOW FOR ADDITIONAL INFORMATION

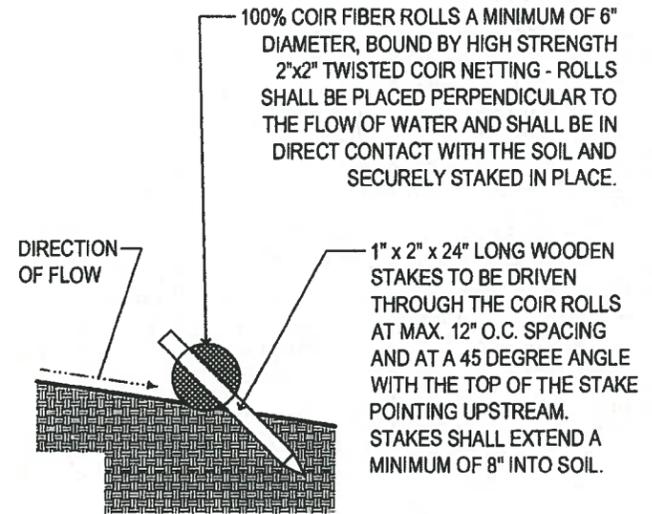
BLANKETS SHALL OVERLAP AT ALL JOINTS (HORIZONTAL AND LONGITUDINAL) A MINIMUM OF 6" - STAPLE OVERLAPS AT MINIMUM 18" INTERVALS



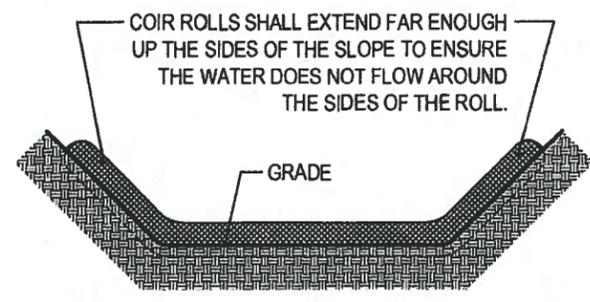
ANCHOR TRENCH TO BE USED AT TOP OF ALL SLOPES AND EVERY 100 LINEAL FEET OF SLOPE. THE EROSION CONTROL BLANKET SHALL BE PLACED IN A 6"x6" TRENCH, STAPLED IN PLACE AND BACKFILLED WITH SOIL AND COMPACTED - BLANKET SHALL BE OVERLAPPED A MINIMUM OF 6" AS SHOWN ABOVE THE BLANKET AND SECURED IT WITH STAPLES

ANCHOR TRENCH SECTION DETAIL

**EROSION CONTROL BLANKET:**  
**CATEGORY 3:** AS DIRECTED BY OWNER'S REPRESENTATIVE FOR DISTURBED AREAS WITH SLOPES BETWEEN 3:1 AND 2:1, COVER WITH CATEGORY 3 EROSION CONTROL BLANKET CONSISTING OF 100% STRAW MATRIX, SUCH AS WESTERN EXCELSIOR EXCEL SS-2 WITH ALL NATURAL NETTING (OR APPROVED EQUAL) MEETING THE MnDOT SPECIFICATION SECTION 3885 REQUIREMENTS.  
**CATEGORY 4:** AS DIRECTED BY OWNER'S REPRESENTATIVE FOR DISTURBED AREAS WITH 2:1 SLOPES OR OVER, COVER WITH CATEGORY 4 EROSION CONTROL BLANKET CONSISTING OF 30% COCONUT / 70% STRAW BLEND, SUCH AS WESTERN EXCELSIOR EXCEL CS-3 WITH ALL NATURAL NETTING (OR APPROVED EQUAL) MEETING THE MnDOT SPECIFICATION SECTION 3885 REQUIREMENTS.



CROSS-SECTION DETAIL



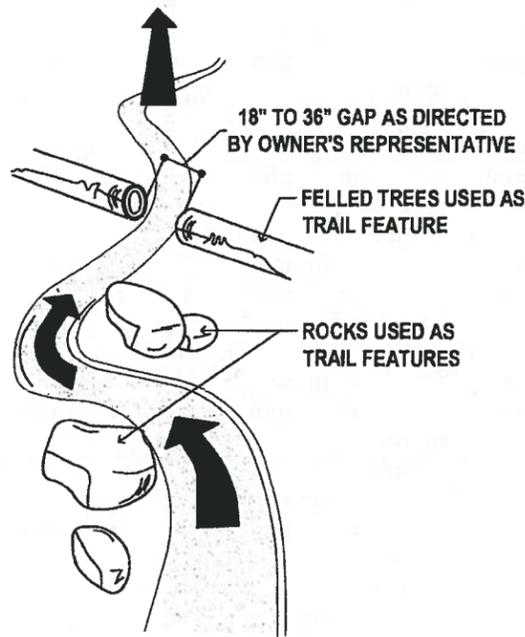
SECTION VIEW

**COIR ROLL DETAIL**  
 NOT TO SCALE

**WOOD FIBER BLANKET DETAIL**  
 NOT TO SCALE

2/6

3/6



**TRAIL FEATURES PLACEMENT NOTE:**  
 FELLED TREES AND ROCKS ENCOUNTERED ALONG THE TRAIL SHALL, AT THE DISCRETION OF THE OWNER'S REPRESENTATIVE, CAN BE USED AS A TRAIL FEATURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLACEMENT OF FELLED TREES AND MOVEABLE ROCKS ON THE EDGE OF THE TRAIL AS DIRECTED BY THE OWNER'S REPRESENTATIVE. MOVEMENT OF ROCKS WILL BE LIMITED TO WITHIN 5 FEET OF ORIGINAL LOCATION. THIS WORK SHALL BE INCLUDED IN THE CONTRACTOR'S UNIT BID PRICE FOR TRAIL CONSTRUCTION TYPES A, B & C.

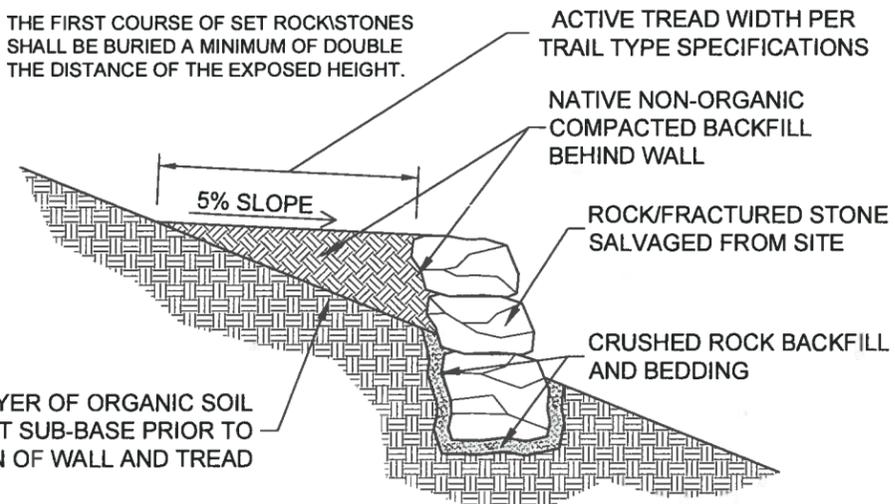
**ROCKS AND FELLED TREES AS TRAIL FEATURES DETAIL**

NOT TO SCALE



**CONSTRUCTION NOTES:**

1. BEDDING MATERIAL SHALL BE 3"- 6" OF 3/4" - CRUSHED ROCK.
2. MINIMUM SET DEPTH FOR STONES/ROCKS SHALL BE 10".
3. THE FIRST COURSE OF SET ROCK/STONES SHALL BE BURIED A MINIMUM OF DOUBLE THE DISTANCE OF THE EXPOSED HEIGHT.



REMOVE LAYER OF ORGANIC SOIL AND COMPACT SUB-BASE PRIOR TO CONSTRUCTION OF WALL AND TREAD

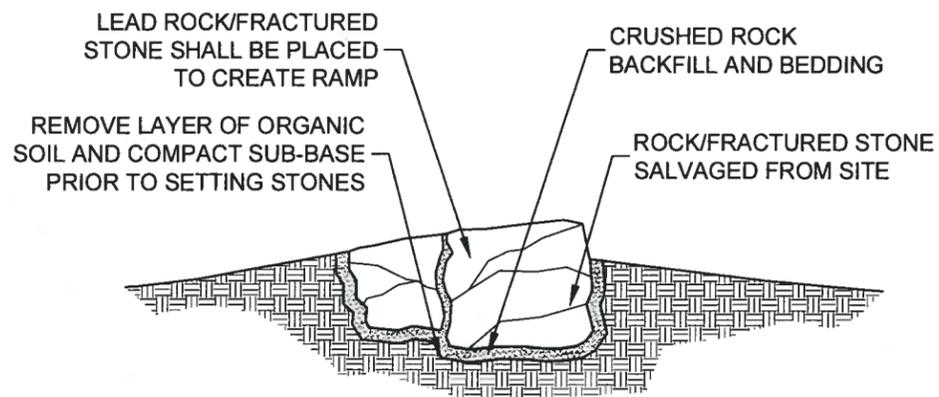
**ROCK RETAINING WALL**

NOT TO SCALE



**PAYMENT NOTE:**

PAYMENT FOR ROCK JUMPS WILL BE FOR ONLY THOSE THAT ARE CREATED BY THE CONTRACTOR. IN CASES WHERE THE TRAIL IS ROUTED OVER AN EXISTING IN-PLACE ROCK, NO EXTRA PAYMENT WILL BE PROVIDED.



**CREATED ROCK JUMP**

NOT TO SCALE



**CONSTRUCTION NOTES:**

1. BEDDING MATERIAL SHALL BE 3"- 6" OF 3/4" - CRUSHED ROCK. THE SAME CRUSHED ROCK SHALL BE UTILIZED FOR FILL BETWEEN THE SET ROCK/STONES.
2. MINIMUM SET DEPTH FOR STONES/ROCKS SHALL BE 10".
3. SEAMS RUNNING IN THE DIRECTION OF TRAVEL SHALL BE MINIMIZED IN BOTH LENGTH AND WIDTH. SEAM WIDTH SHALL BE MINIMIZED AND SEAM STAGGERING SHALL BE USED WHERE POSSIBLE.
4. SET ROCK/STONE SHALL BE BURIED A MINIMUM OF DOUBLE THE DISTANCE OF THE EXPOSED HEIGHT.
5. ALLOWABLE JUMP HEIGHT RANGE IS BETWEEN 6" TO 24".
6. THE DETERMINATION OF THE PLACEMENT OF ANY ROCK JUMPS WILL BE DONE BY THE OWNER'S REPRESENTATIVE AFTER THE COMPLETION OF THE ROUGH GRADING.



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**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
 DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

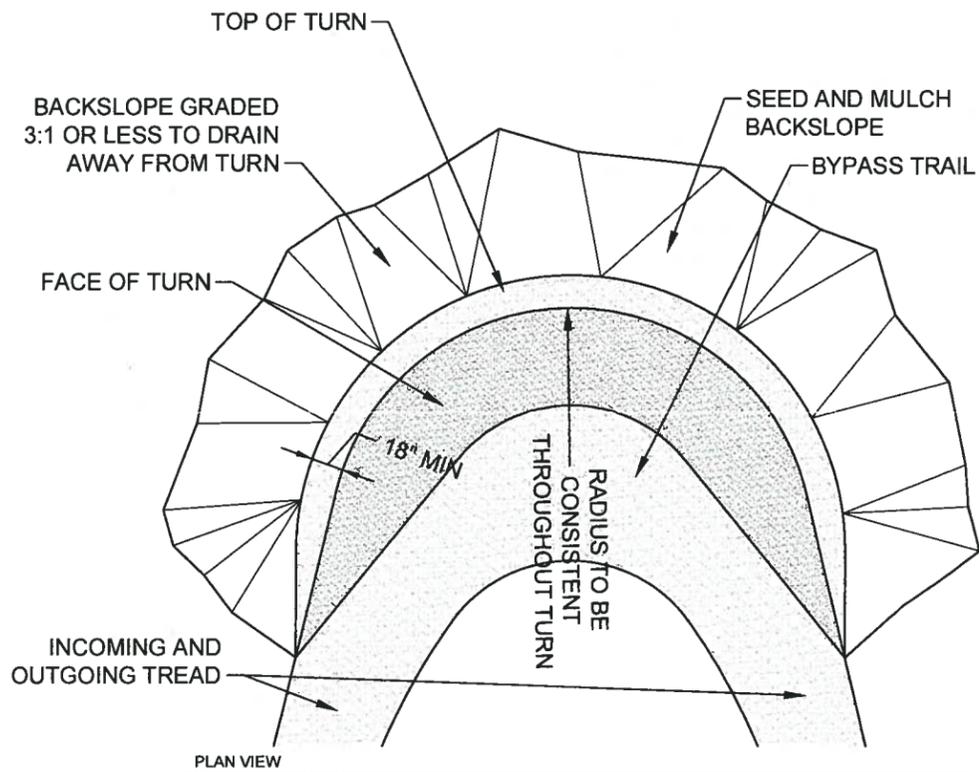
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JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT REG. ILL.

**TRAIL FEATURE DETAILS**



**PAYMENT NOTE:**

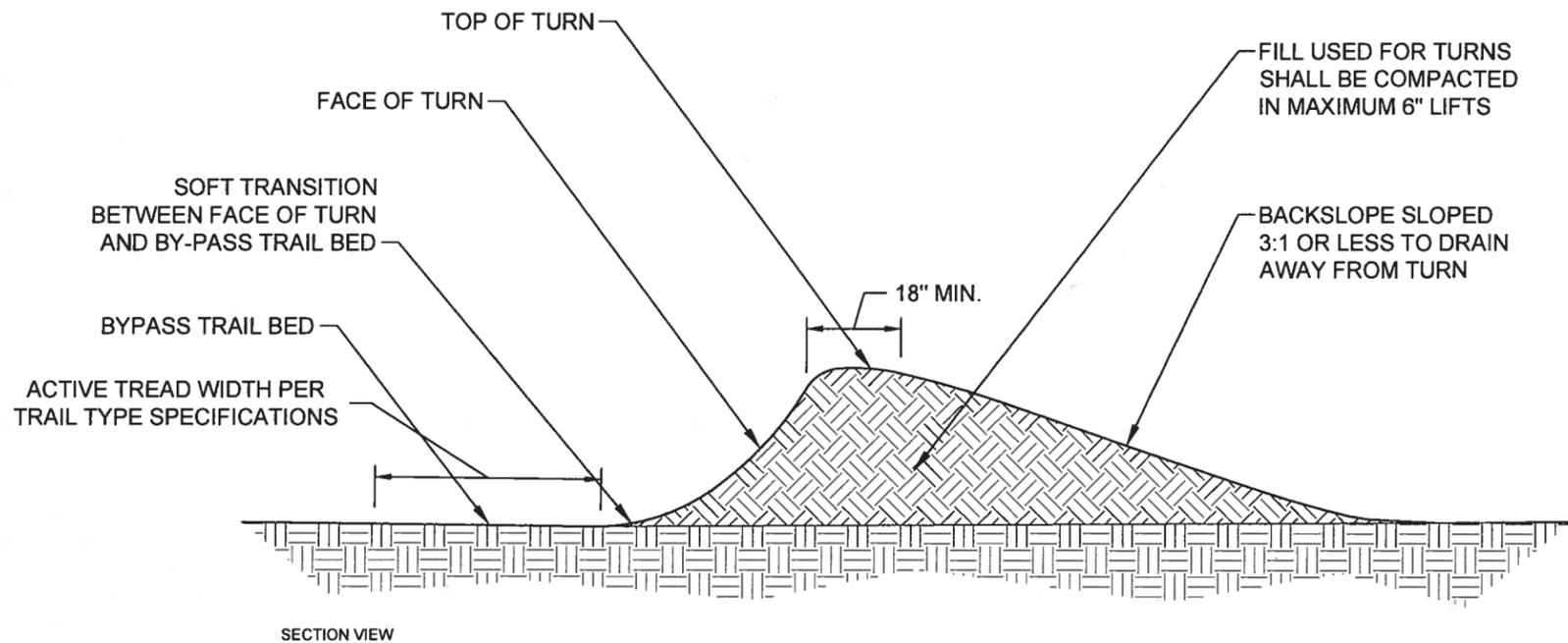
PAYMENT FOR BERMED TURNS WILL BE ON A LINEAL FOOT BASIS, FOR CONSTRUCTED TURNS PAYMENT WILL BE ON A PER UNIT BASIS. IN CASES WHERE TRAIL IS ROUTED WHERE AN EXISTING EMBANKMENT OR SIDE HILL IS USED FOR A TURN, NO EXTRA PAYMENT WILL BE PROVIDED.

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**

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1/8



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INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION

**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**

DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

DRAWN BY: TTP

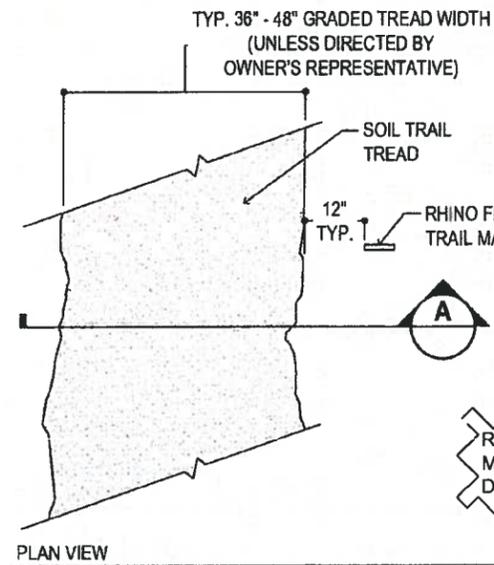
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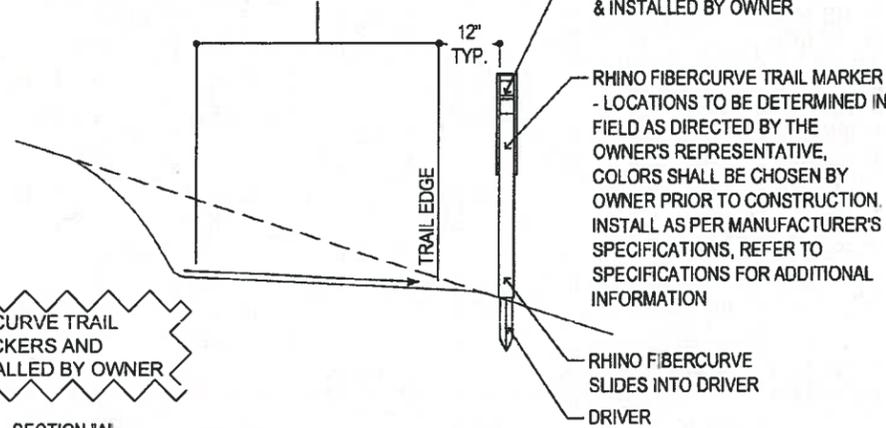
JAMES M. SROBERG 45577  
LANDSCAPE ARCHITECT REG. NO.

**TRAIL FEATURE DETAILS**

8



TYP. 36" - 48" GRADED TREAD WIDTH  
(UNLESS DIRECTED BY  
OWNER'S REPRESENTATIVE)



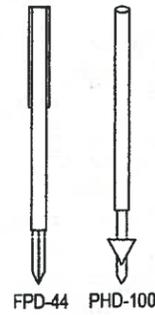
RHINO FIBERCURVE TRAIL  
MARKER, STICKERS AND  
DECALS INSTALLED BY OWNER

DECALS WILL BE SELECTED BY THE  
OWNER PRIOR TO CONSTRUCTION  
& INSTALLED BY OWNER

RHINO FIBERCURVE TRAIL MARKER  
- LOCATIONS TO BE DETERMINED IN  
FIELD AS DIRECTED BY THE  
OWNER'S REPRESENTATIVE,  
COLORS SHALL BE CHOSEN BY  
OWNER PRIOR TO CONSTRUCTION.  
INSTALL AS PER MANUFACTURER'S  
SPECIFICATIONS, REFER TO  
SPECIFICATIONS FOR ADDITIONAL  
INFORMATION

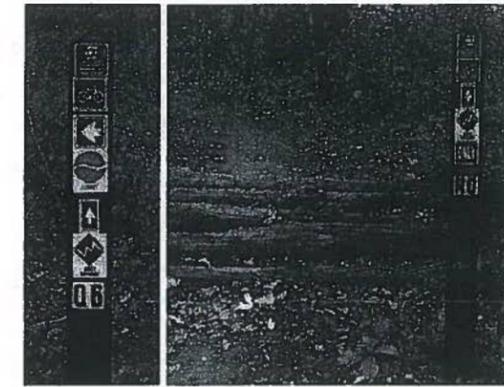
RHINO FIBERCURVE  
SLIDES INTO DRIVER  
DRIVER

**MANUFACTURER CONTACT INFORMATION:**  
RHINO, A DEVISION OF REPNET, INC.  
280 UNIVERSITY DRIVE SW  
WASECA, MN 56093  
PH: 1-800-522-4343  
FAX: 1-888-522-4343



DRIVER DETAIL

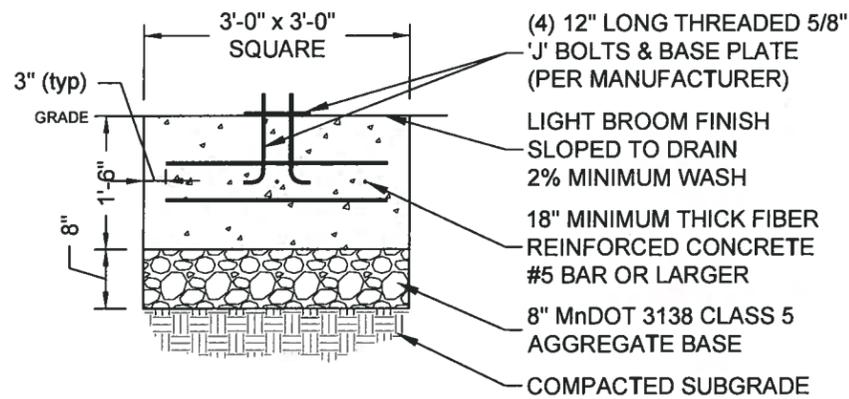
**DRIVER TYPES: TWO DRIVER  
TYPES ARE AVAILALBE  
DEPENDING ON THE SOIL  
CONDITIONS. TYPE OF DRIVER  
WILL BE DETERMINED IN  
FIELD AT THE DISCRETION OF  
THE CONTRACTOR AND  
OWNER'S REPRESENTATIVE.**  
FPD-44 DRIVER - LOAMY SOILS  
PHD-100 PILOT HOLE DRIVER -  
HARD OR ROCKY SOIL  
CONDITIONS



EXAMPLES OF TRAIL MARKER

**TRAIL MARKER DETAIL (BY OWNER) (24 REQUIRED)**

NOT TO SCALE



CONCRETE BASE DETAIL

NOT TO SCALE

**MANUFACTURER CONTACT INFORMATION:**  
Iron Rangers, LLC  
5009 N Burns RD  
Spokane Valley, WA 99216  
PH: 1-800-262-3322  
FAX: 1-509-326-5436

**IRON RANGER FEE  
COLLECTION SPECIFICATIONS:**  
Model: FS836 Shell / FS836 Insert Series  
Option: EB-1 Empty Envelope Box  
Color: Martin Brown Powder Coated Finish



EXAMPLE OF  
FEE STATION

**INSTALLATION:**  
INSTALL PER MANUFACTURER  
RECOMMENDATIONS IN CONCRETE BASE.

CONTRACTOR RESPONSIBLE  
FOR INSTALLATION OF IRON  
RANGER FEE STATION

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

NOT TO SCALE

1  
9



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**DULUTH  
TRAVERSE  
TRAIL  
LESTER PARK  
PHASE 1**

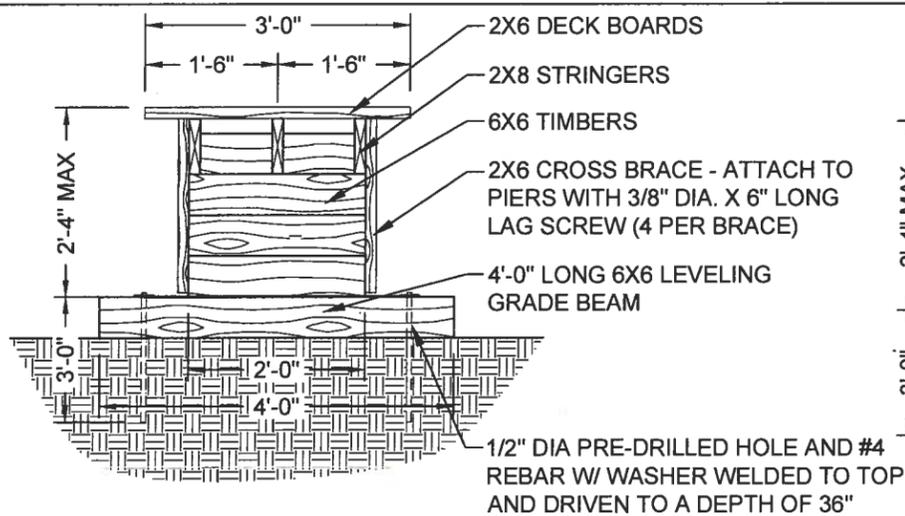
DULUTH, MINNESOTA

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LANDSCAPE ARCHITECT REG. 180

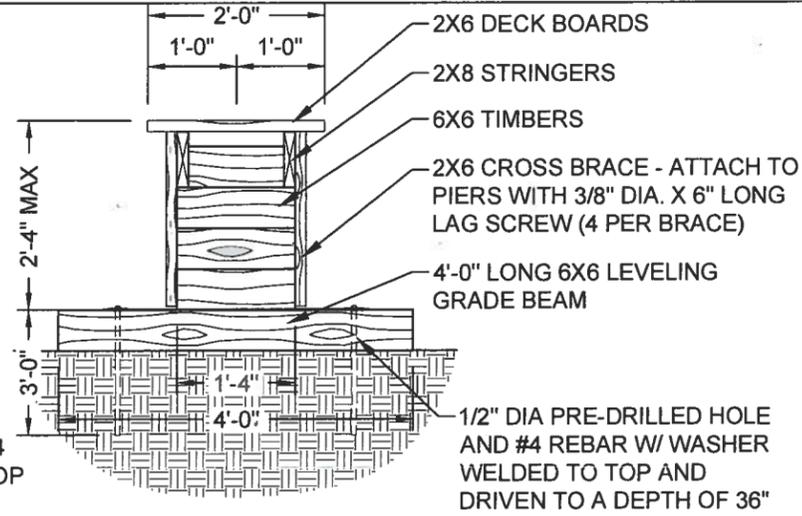
**TRAIL  
SIGNAGE  
DETAILS**



**36" WIDE BOARDWALK**

NOT TO SCALE

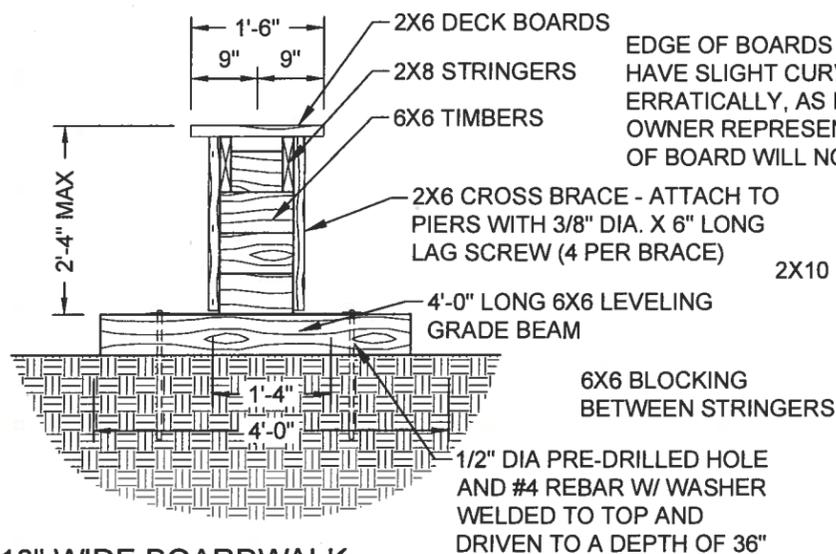
1/10



**24" WIDE BOARDWALK**

NOT TO SCALE

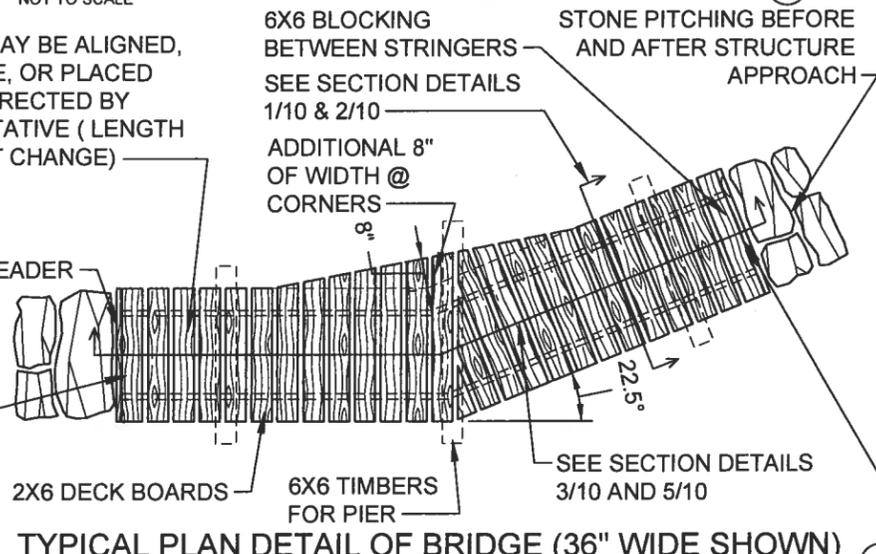
2/10



**18" WIDE BOARDWALK**

NOT TO SCALE

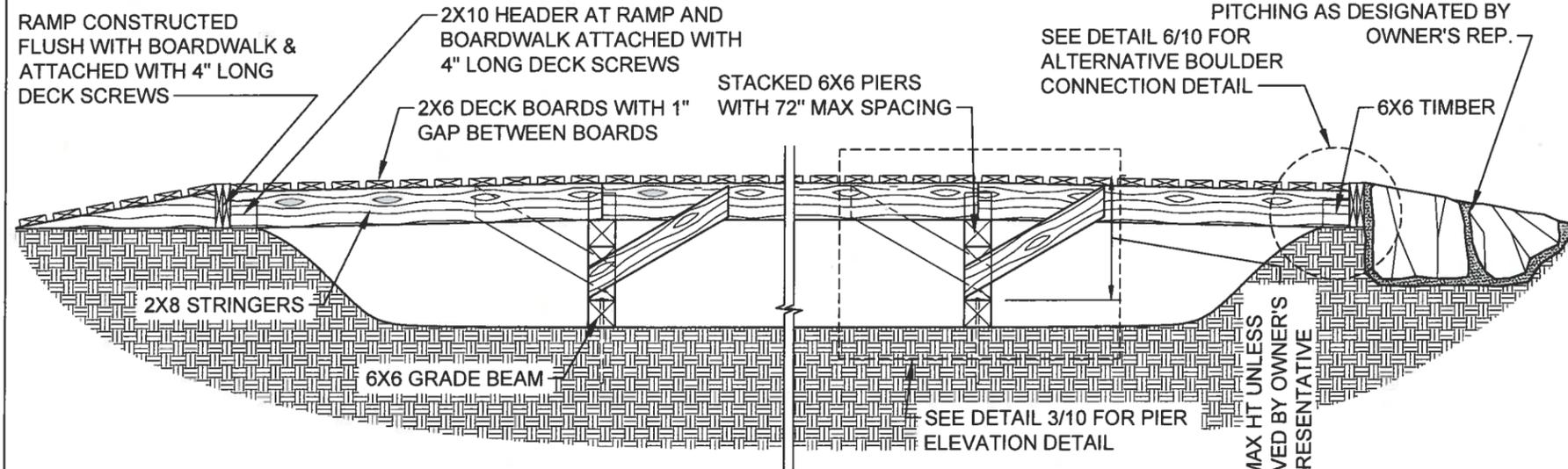
3/10



**TYPICAL PLAN DETAIL OF BRIDGE (36" WIDE SHOWN)**

NOT TO SCALE

4/10



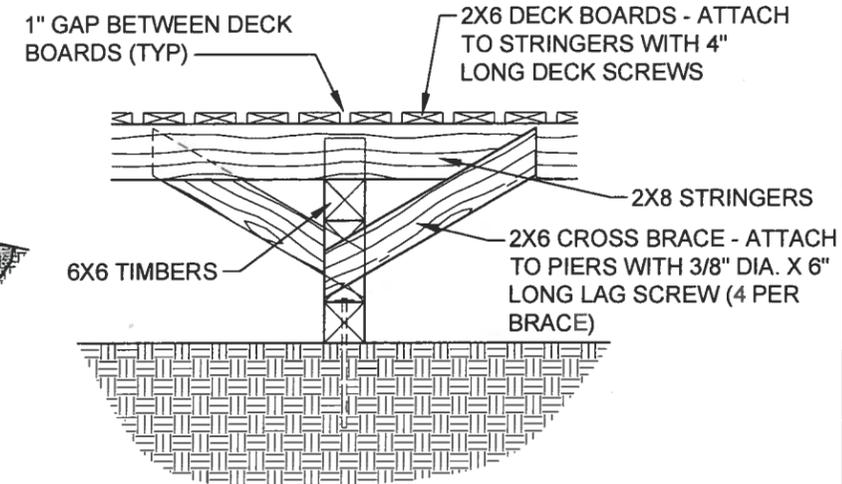
**TYPICAL ELEVATION DETAIL FOR BOARDWALK (WET AREA CROSSINGS)**

NOT TO SCALE

5/10

- DETAIL NOTES:**
- 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.
  - ROT-RESISTANT TREATMENTS OTHER THAN THOSE LISTED MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO BIDDING.
  - LEVELING GRADE BEAMS SHALL BE SHIMMED AS NECESSARY TO MEET DESIRED PITCH OF STRUCTURE
  - PRESERVE LUMBER IN ACCORDANCE WITH THE SPECIFICATIONS.
  - SELECT FASTENERS AND HARDWARE IN ACCORDANCE WITH THE SPECIFICATIONS
  - SEE SPECIFICATIONS FOR FINISHED TRAIL CONSTRUCTION DETAILS.
  - SEE SPECIFICATIONS FOR UNIT DEFINITIONS AND TREAD CONSTRUCTION DETAIL DRAWINGS.
  - 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.
  - SIZES, LENGTHS AND EXTENT OF ALL BOARDWALKS, ROCK HARDENED TREAD, BRIDGES AND BERMS TO BE FIELD FIT AT TIME OF CONSTRUCTION.
  - BOARDWALK & BRIDGE CONSTRUCTION LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE TIME OF CONSTRUCTION.
  - 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.
  - 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.
  - 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.
  - WOOD RAMPS OR STONE PITCHING MAY 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 BID PRICE OF ROCK ARMORING.

2X10 HEADER - ATTACH TO STRINGERS WITH 4" LONG DECK SCREW - ATTACH TO BLOCKING WITH 3/8" DIA X 4" LONG LAG SCREW



**TYPICAL ELEVATION @ PIER LOCATION**

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6/10



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**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

DRAWN BY: TTP

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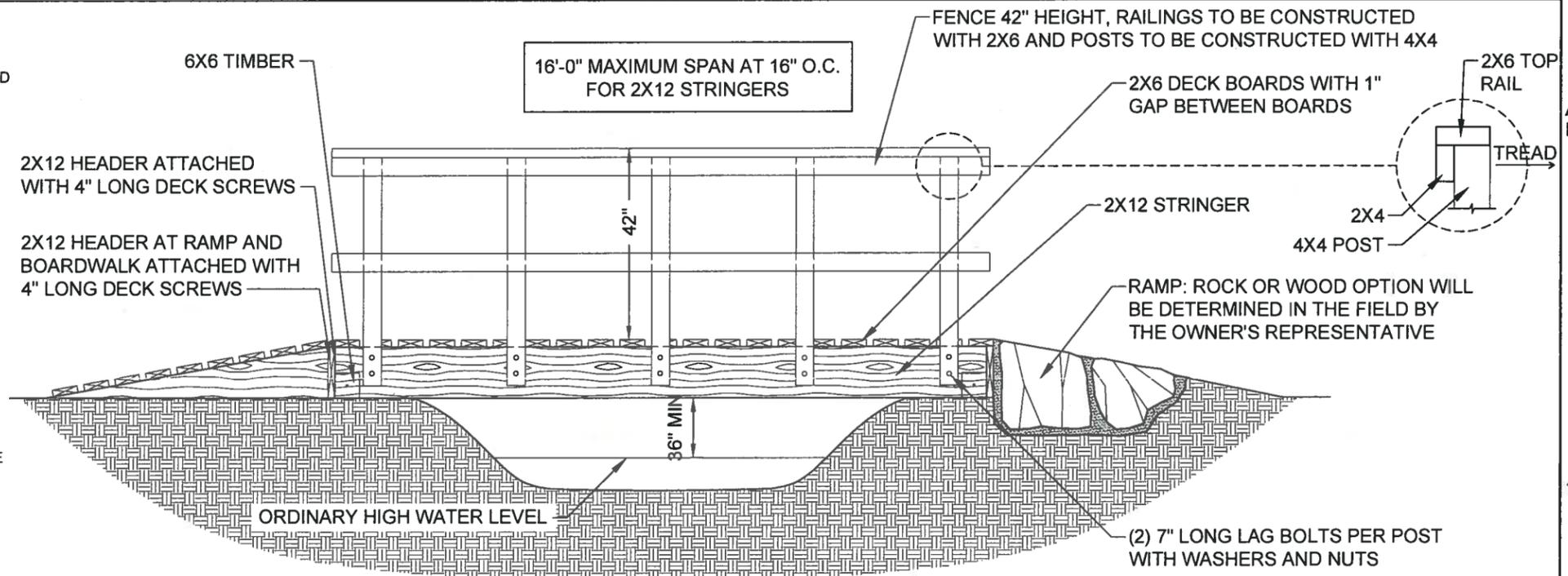
JAMES M. SHROBERG 45577  
LANDSCAPE ARCHITECT REG. NO.

**WOOD - TRAIL FEATURE DETAILS**

**10**

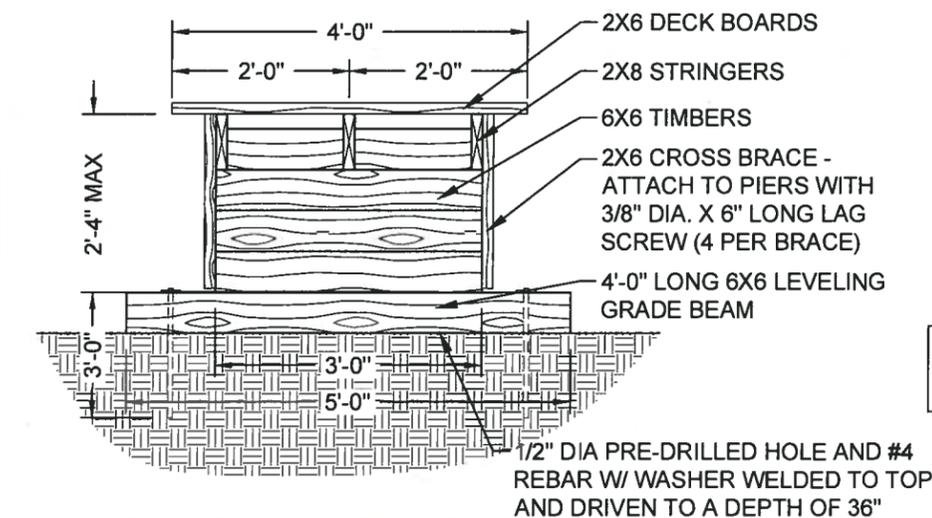
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**TYPICAL ELEVATION DETAIL FOR BRIDGE (CREEK CROSSINGS)**

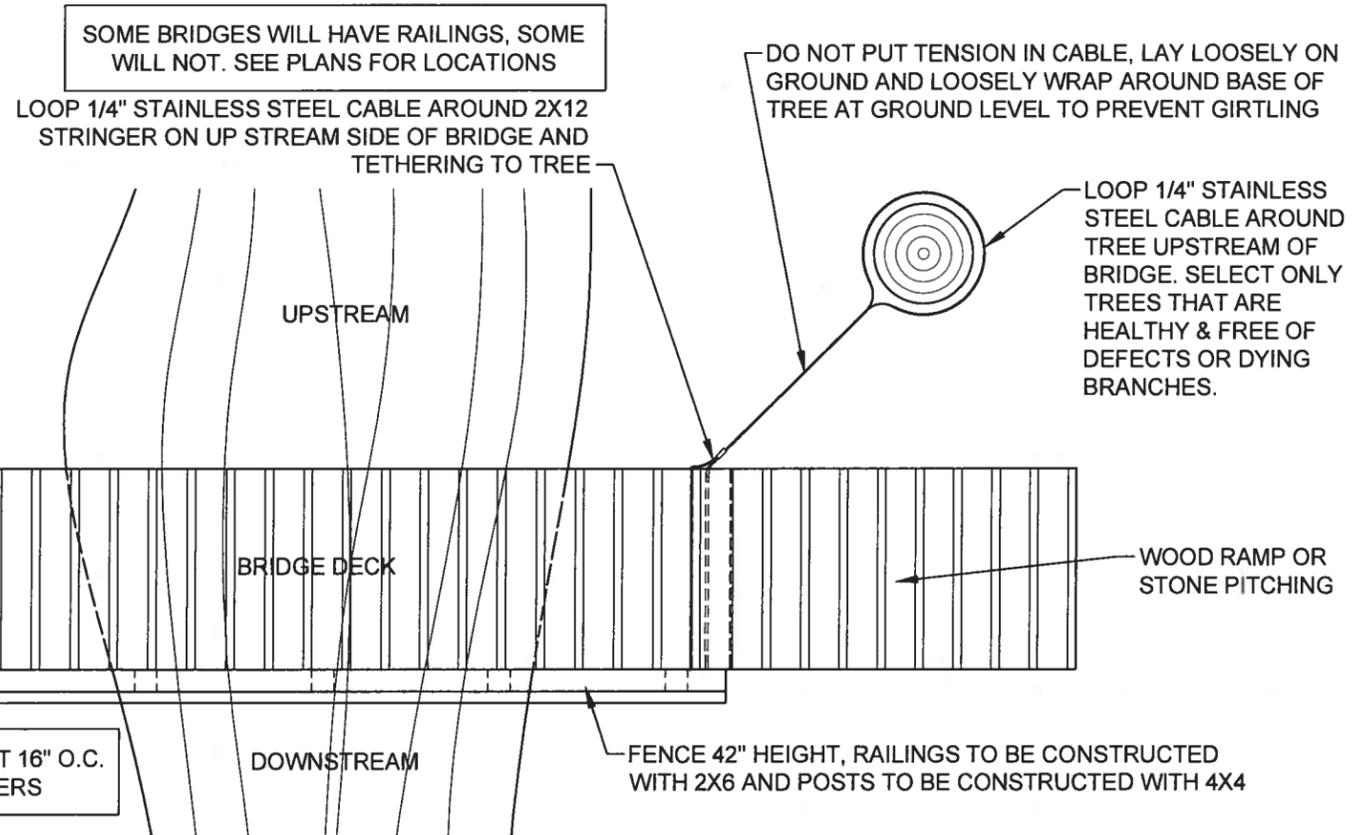
NOT TO SCALE



**48\"/>**

NOT TO SCALE

2/11



**TYPICAL PLAN DETAIL FOR BRIDGE (CREEK CROSSINGS)**

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3/11



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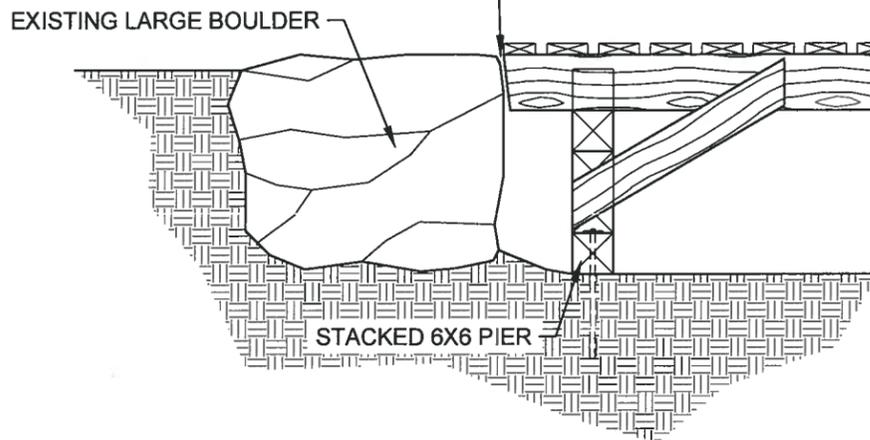
JAMES M. SROBERG 45677  
LANDSCAPE ARCHITECT REG. NO.

**WOOD - TRAIL FEATURE DETAILS**

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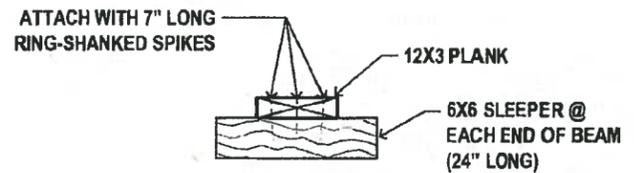
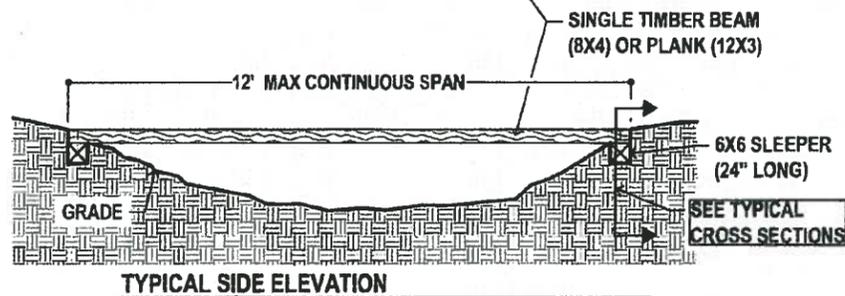
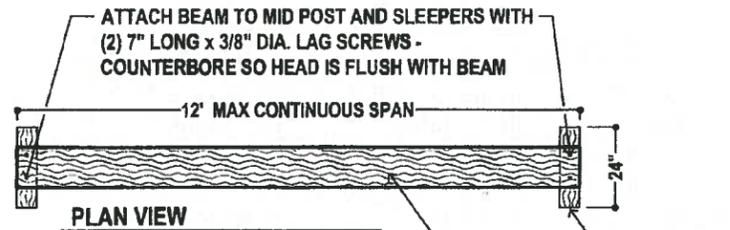
CUSTOM CUT STRINGERS AND END DECK BOARD TO FIT ADJACENT TO EXISTING BOULDER WITH MINIMUM GAP



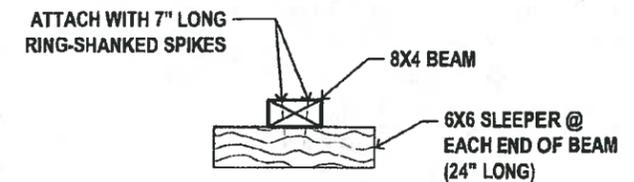
**BOARDWALK CROSSING ABUTTING TO BOULDER**

NOT TO SCALE

1/12



**TYPICAL CROSS SECTION - 12" WIDE WOOD SKILLS PLANK**



**TYPICAL CROSS SECTION - 8" WIDE WOOD SKILLS BEAM**

**WOOD SKILLS "BEAM" & "PLANK" DETAILS**

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2/12



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**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

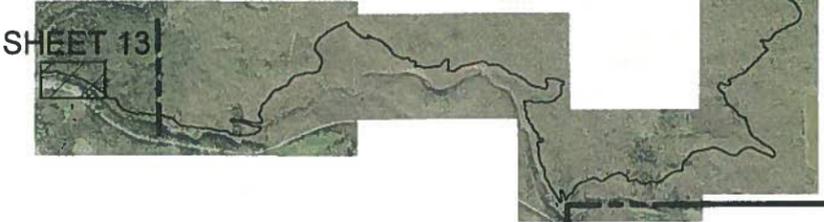
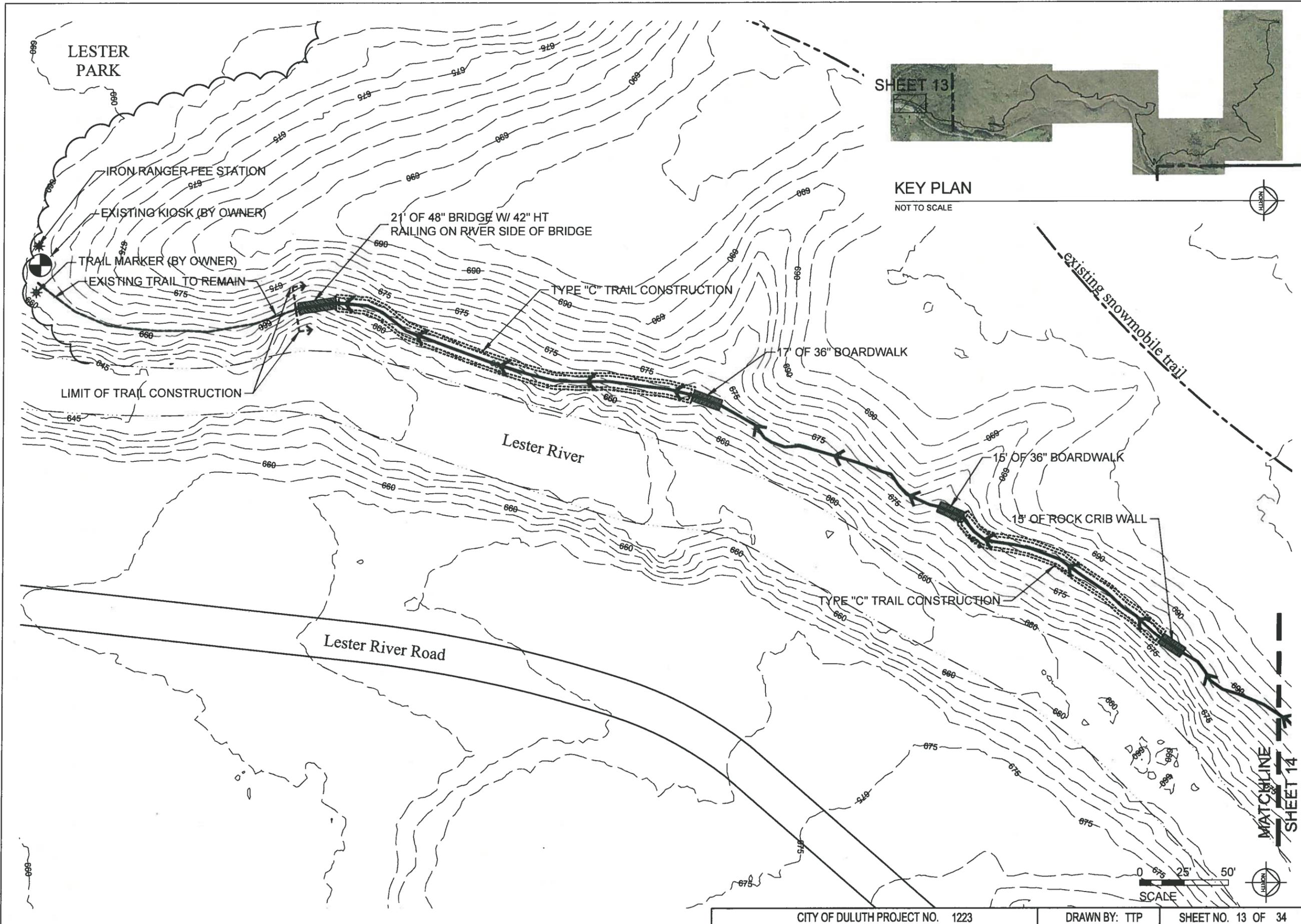
DRAWN BY: TTP

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JAMES M. SHOBERG 45577  
LANDSCAPE ARCHITECT REG. NO.

**WOOD - TRAIL FEATURE DETAILS**



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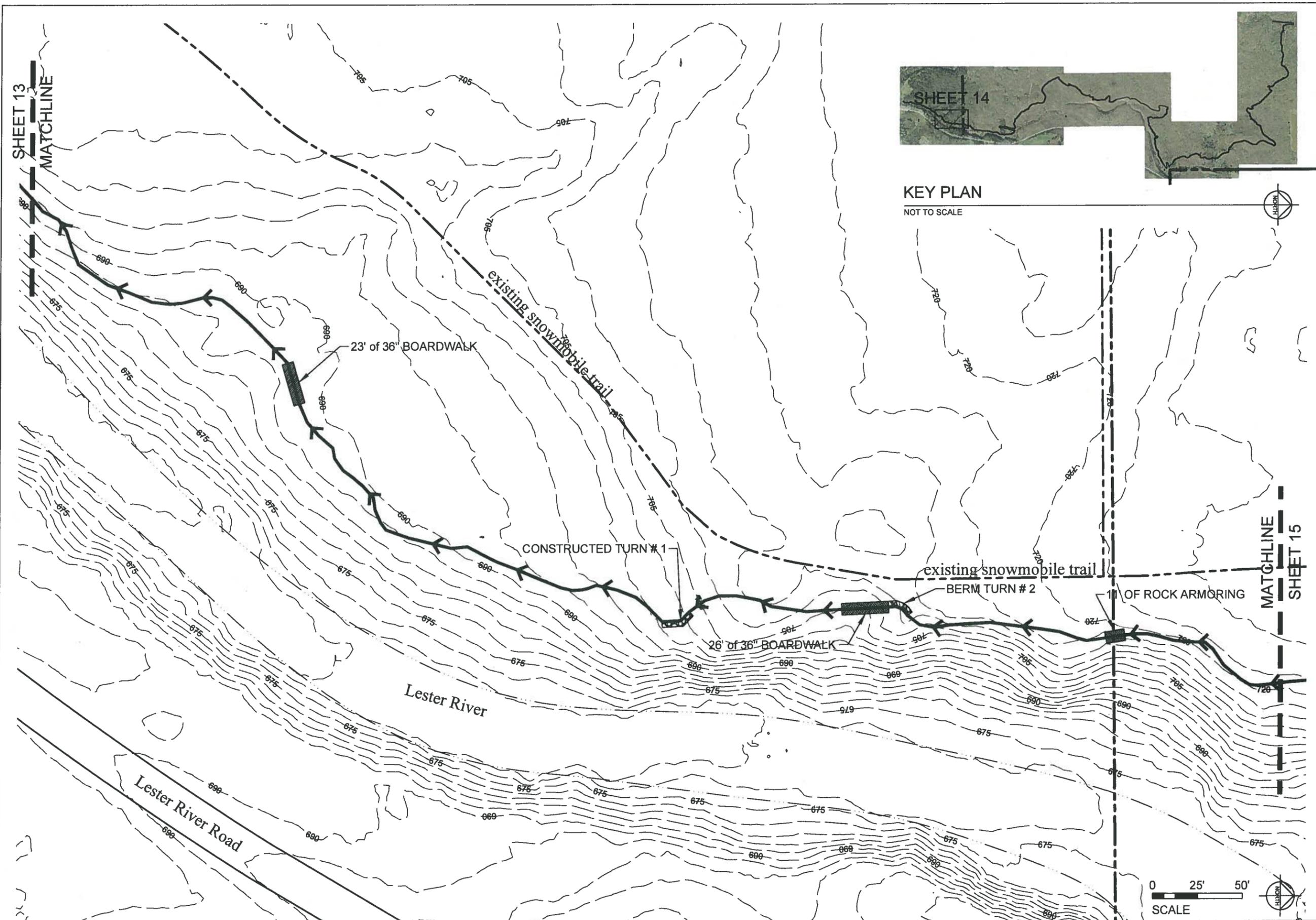
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**TRAIL PLAN**

**13**

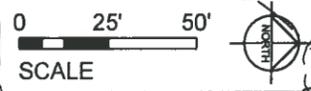


SHEET 13  
MATCHLINE

MATCHLINE  
SHEET 15



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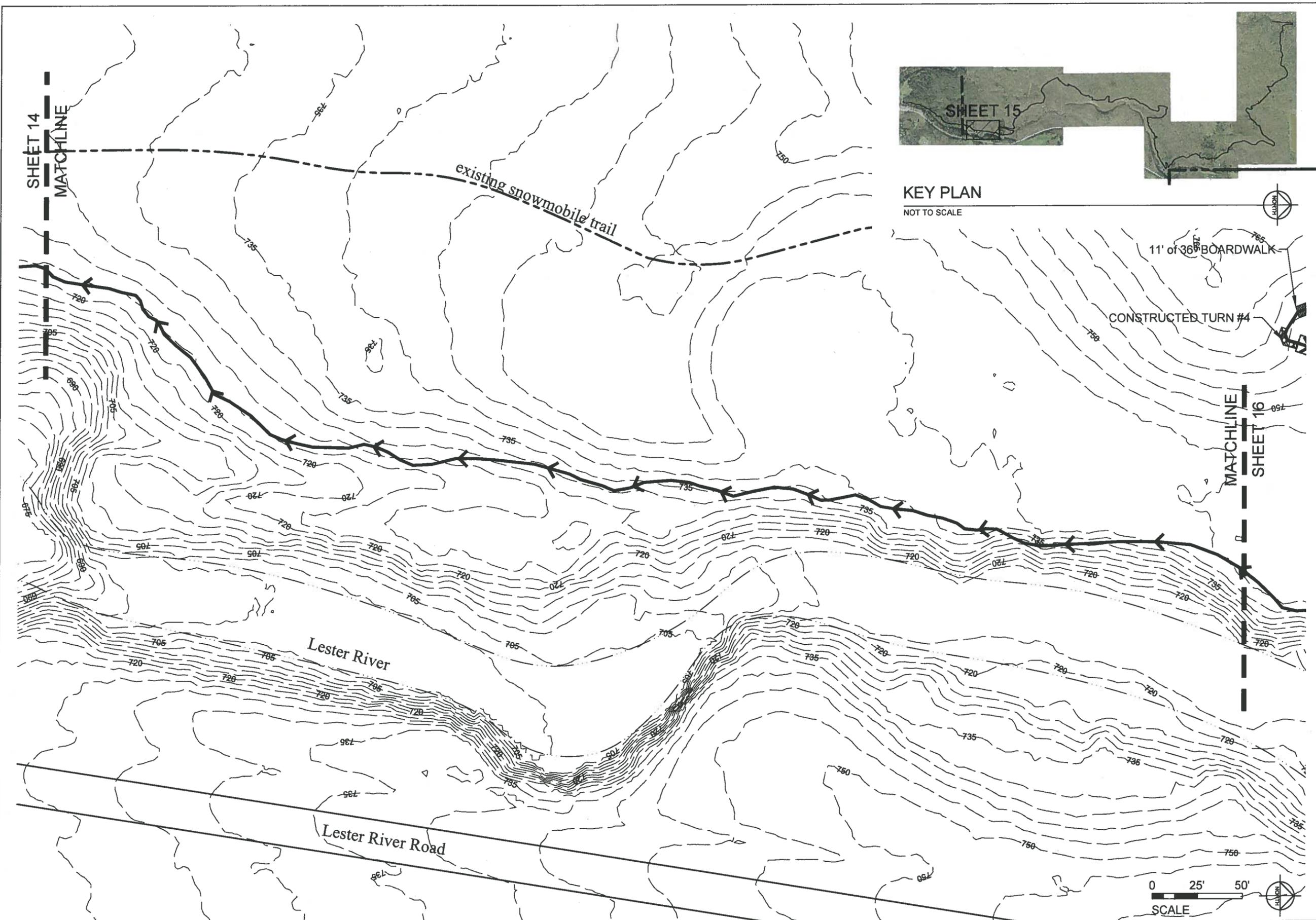
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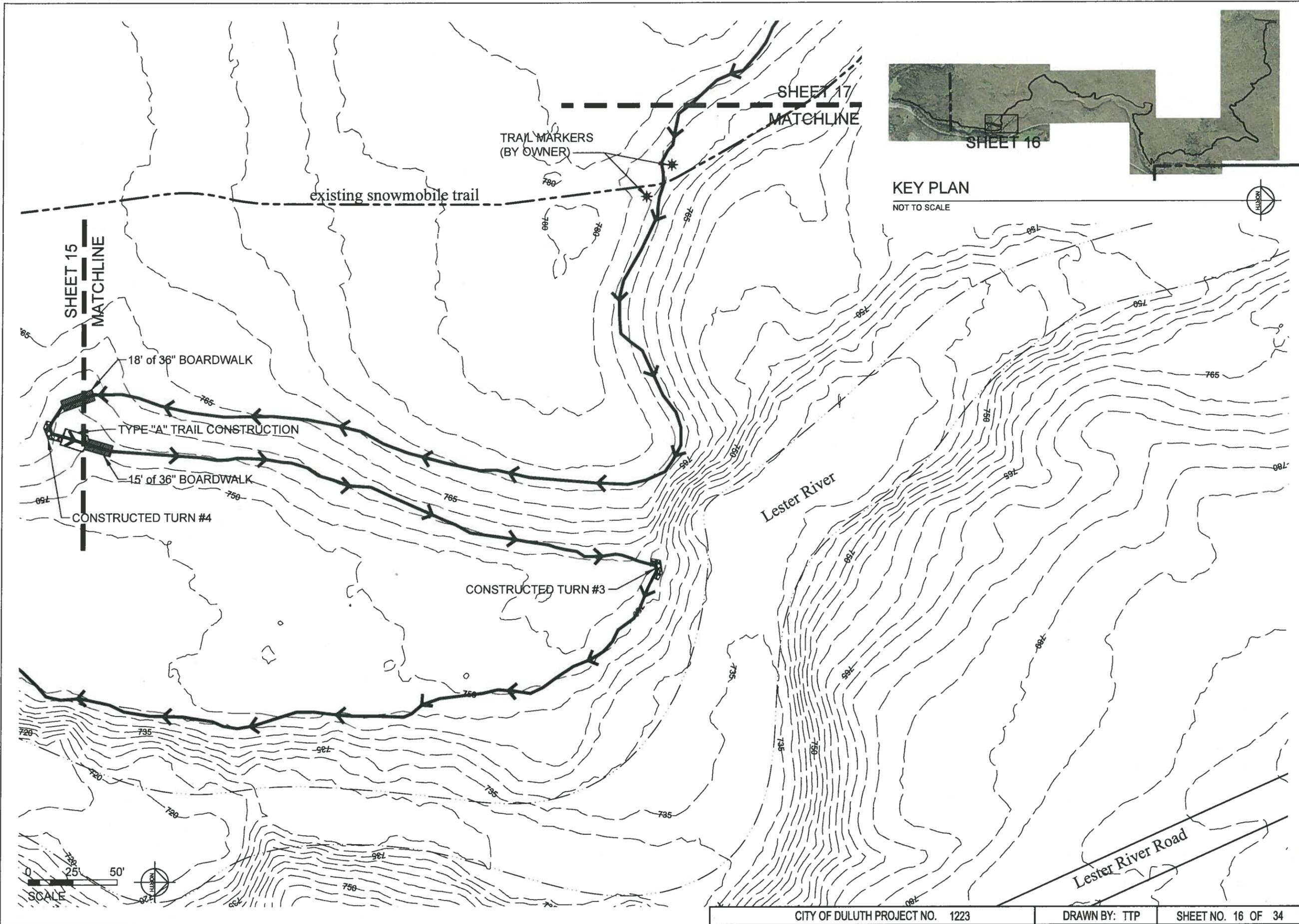
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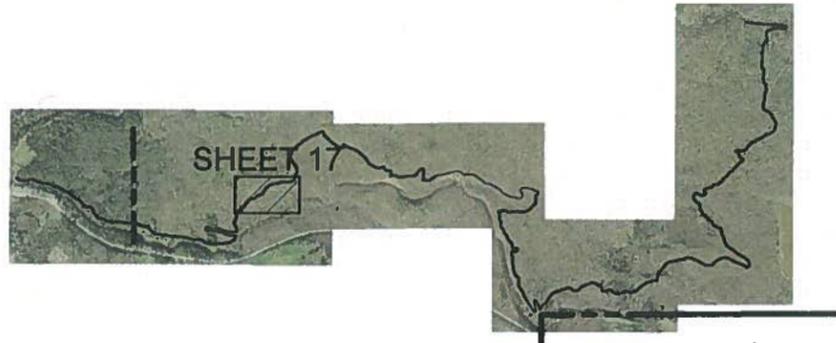
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PROJECT NO.:	12-039
DATE:	MAY-7-2013
DRAWN BY:	TTP
REVISIONS:	

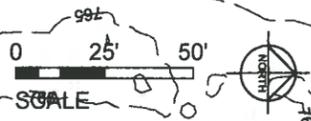
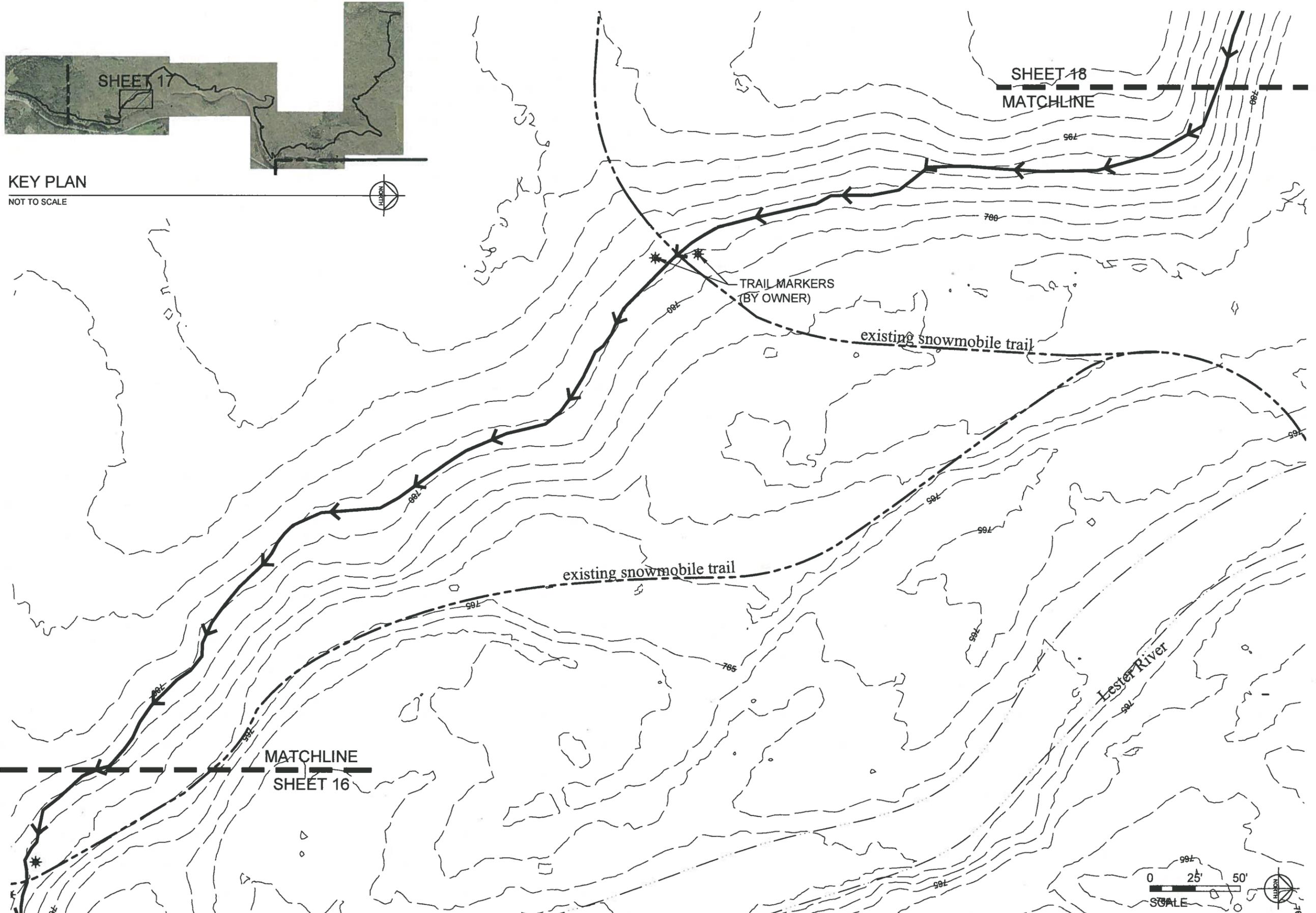
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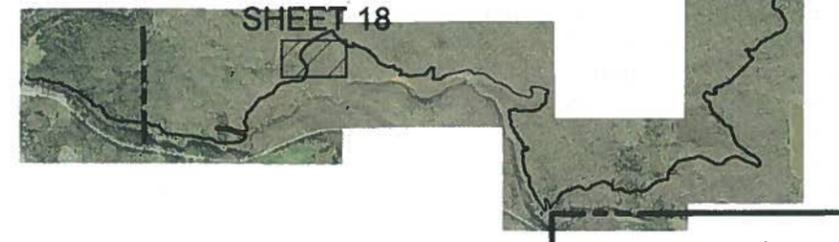
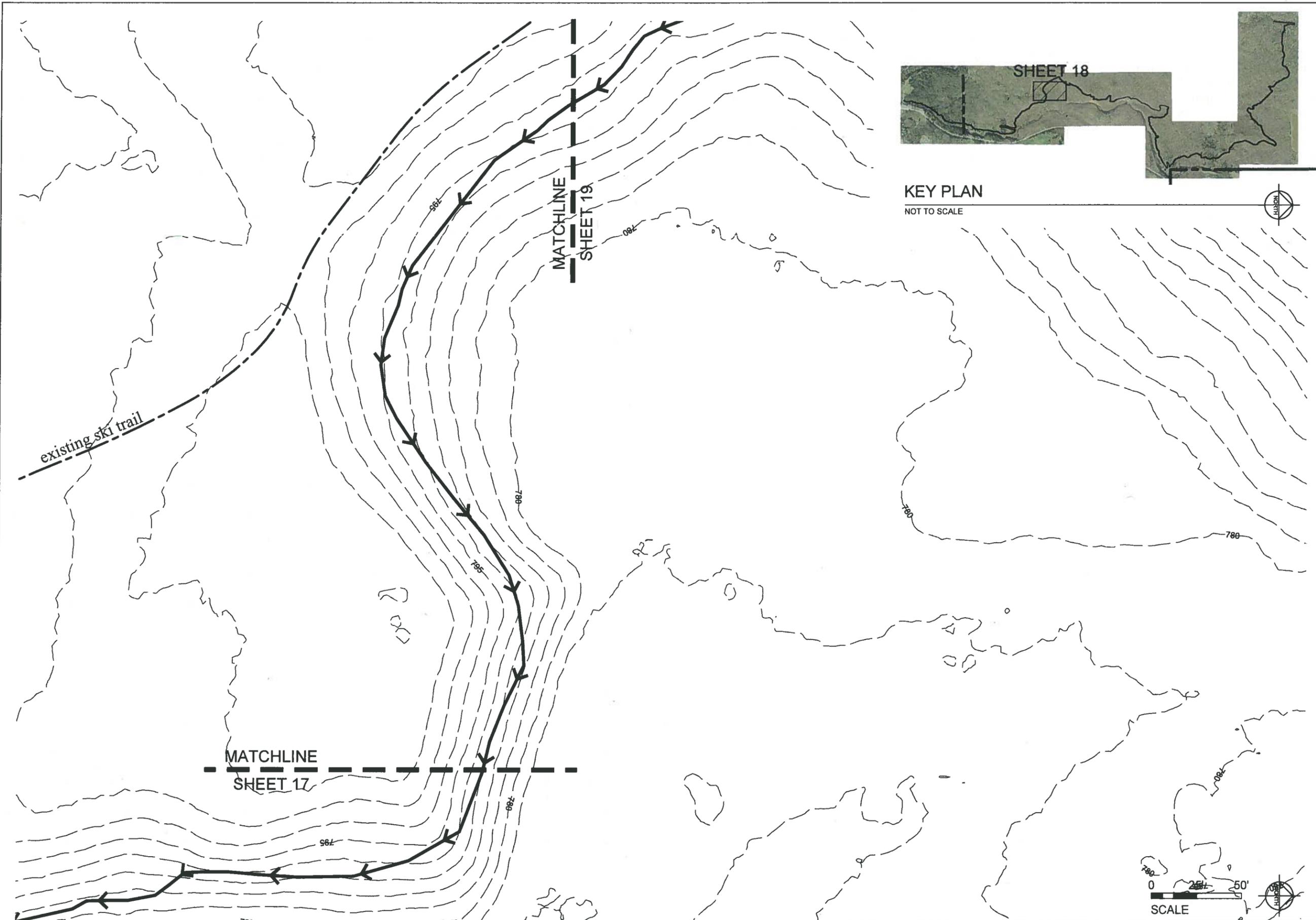
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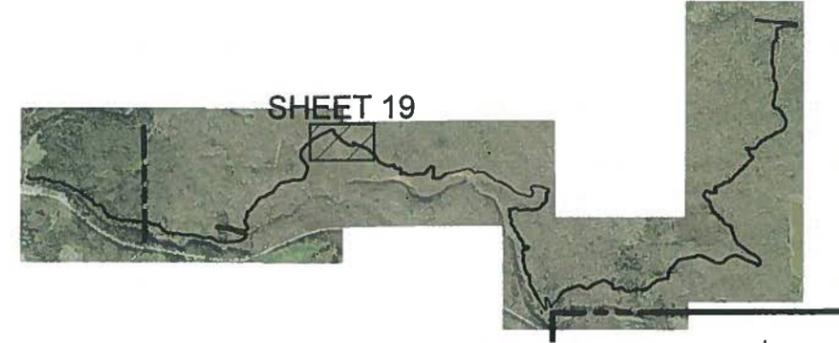
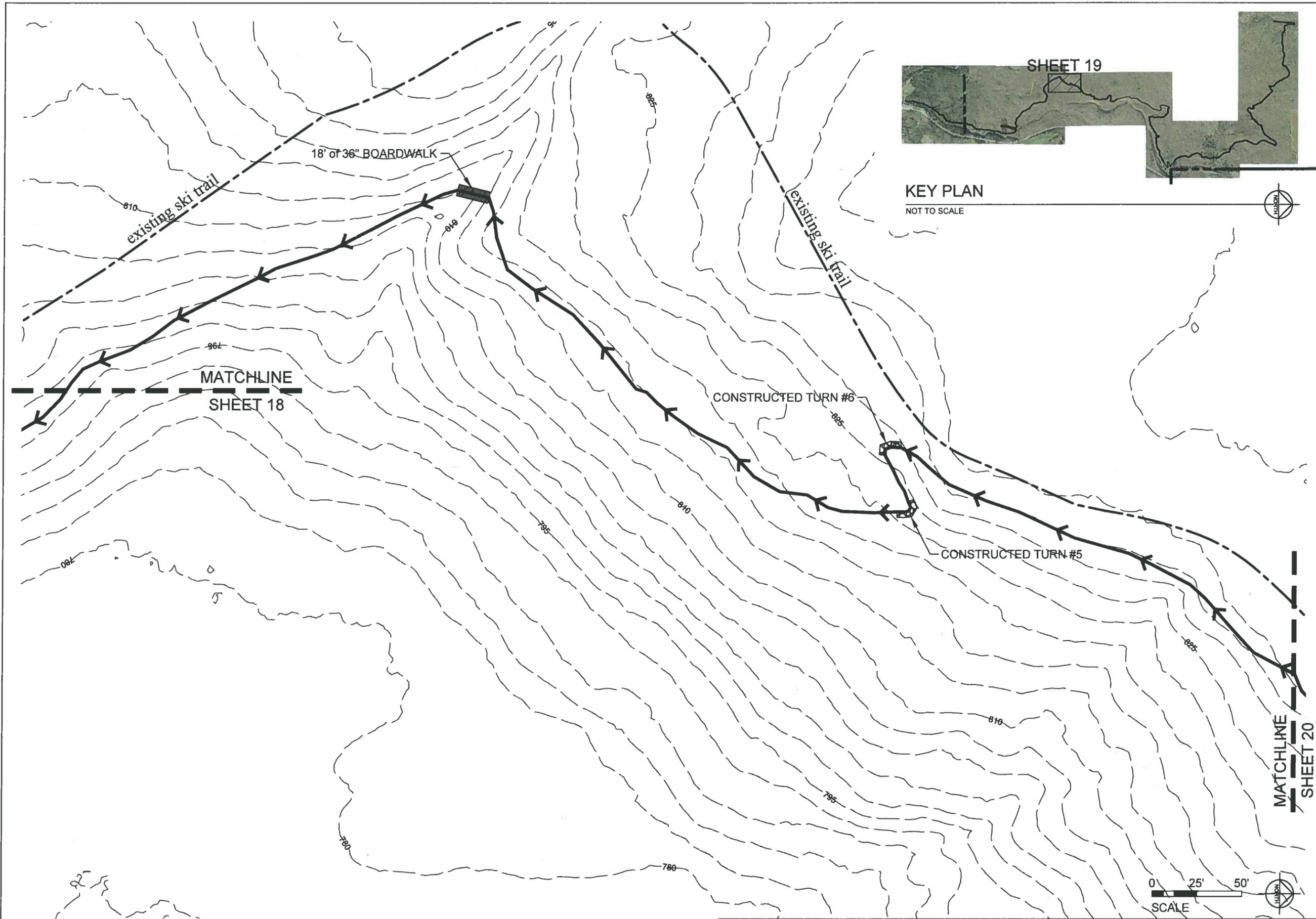
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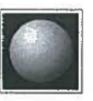
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MATCHLINE  
SHEET 20



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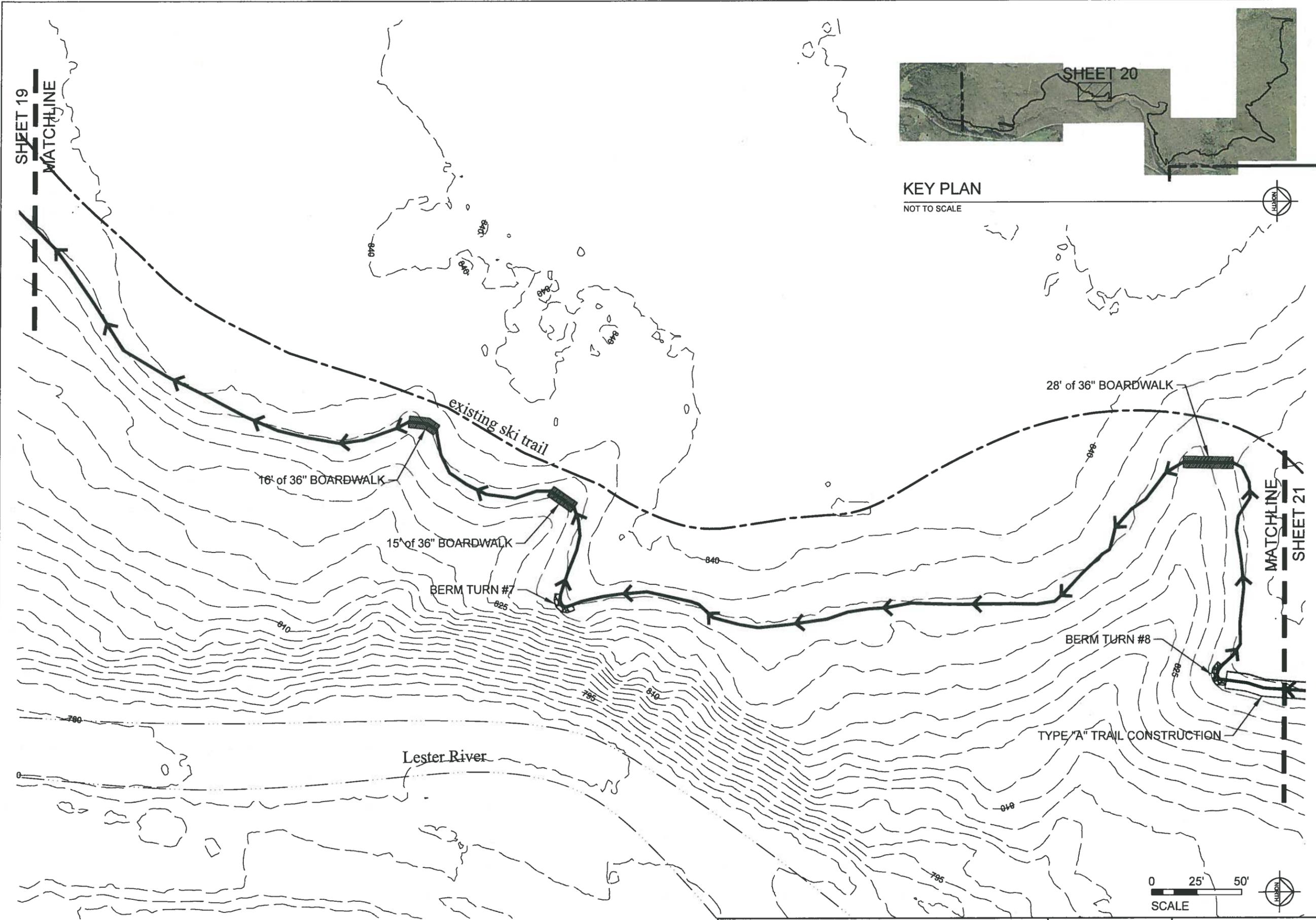
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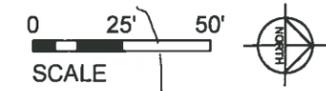
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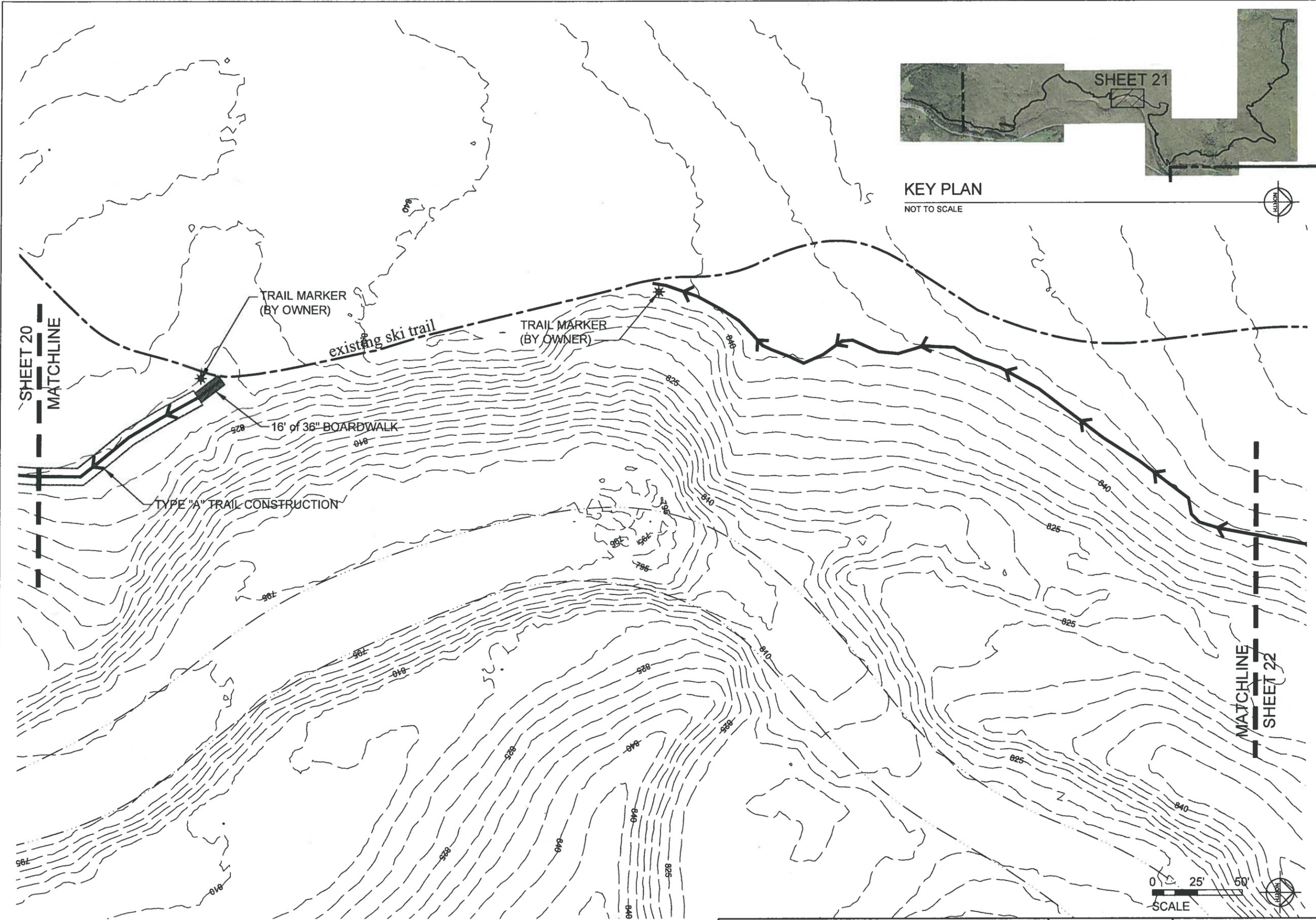
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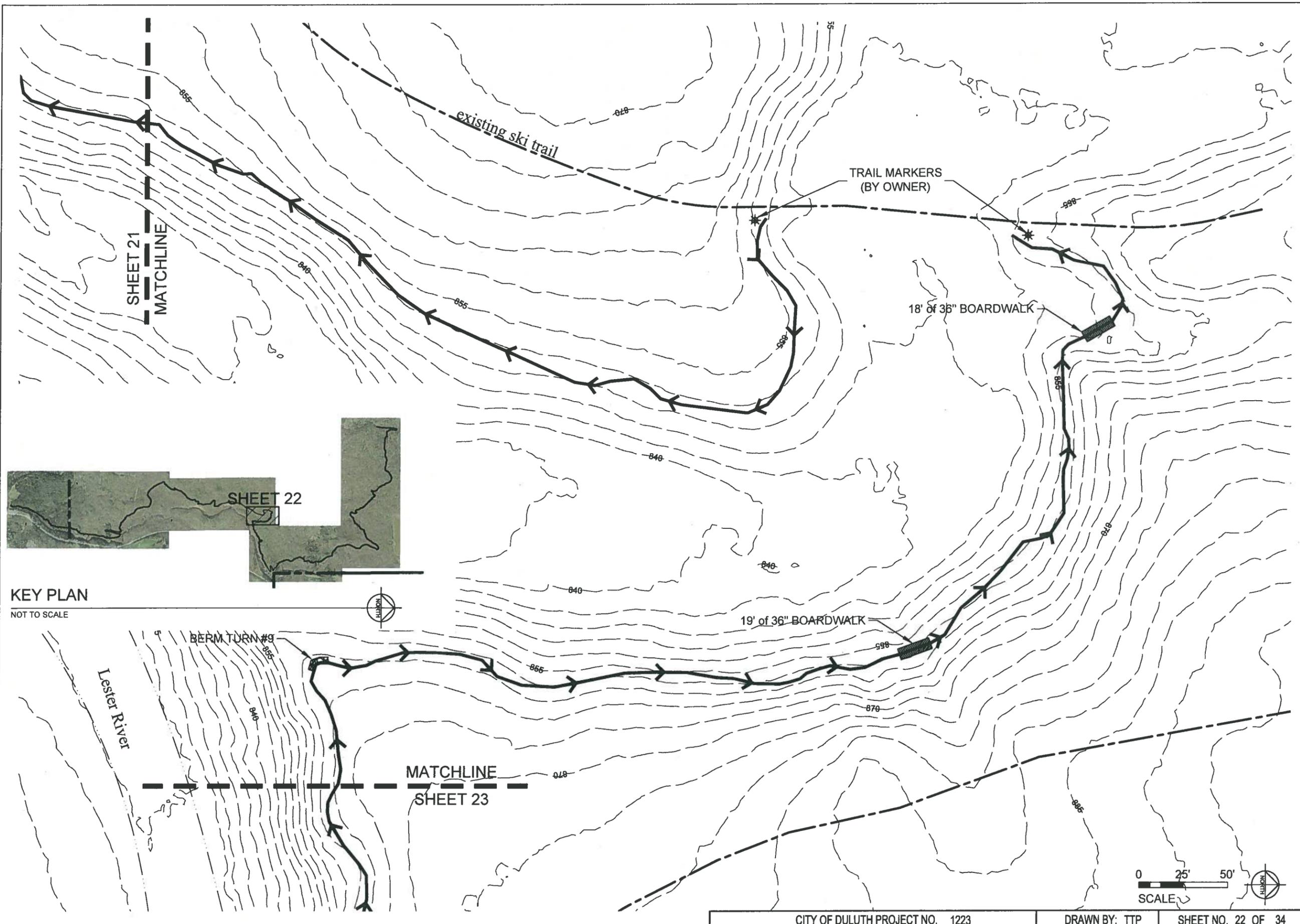
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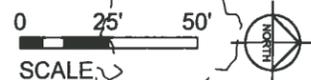
  
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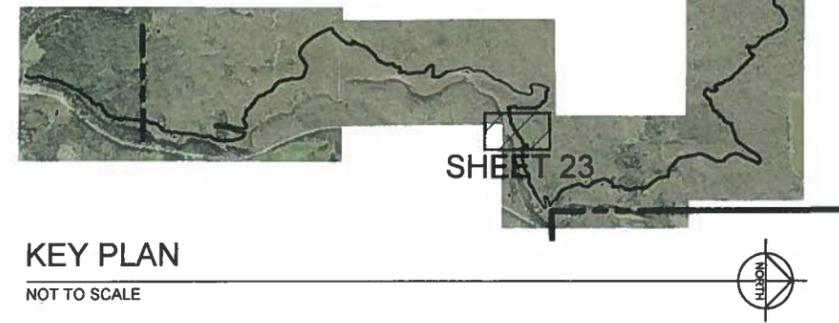
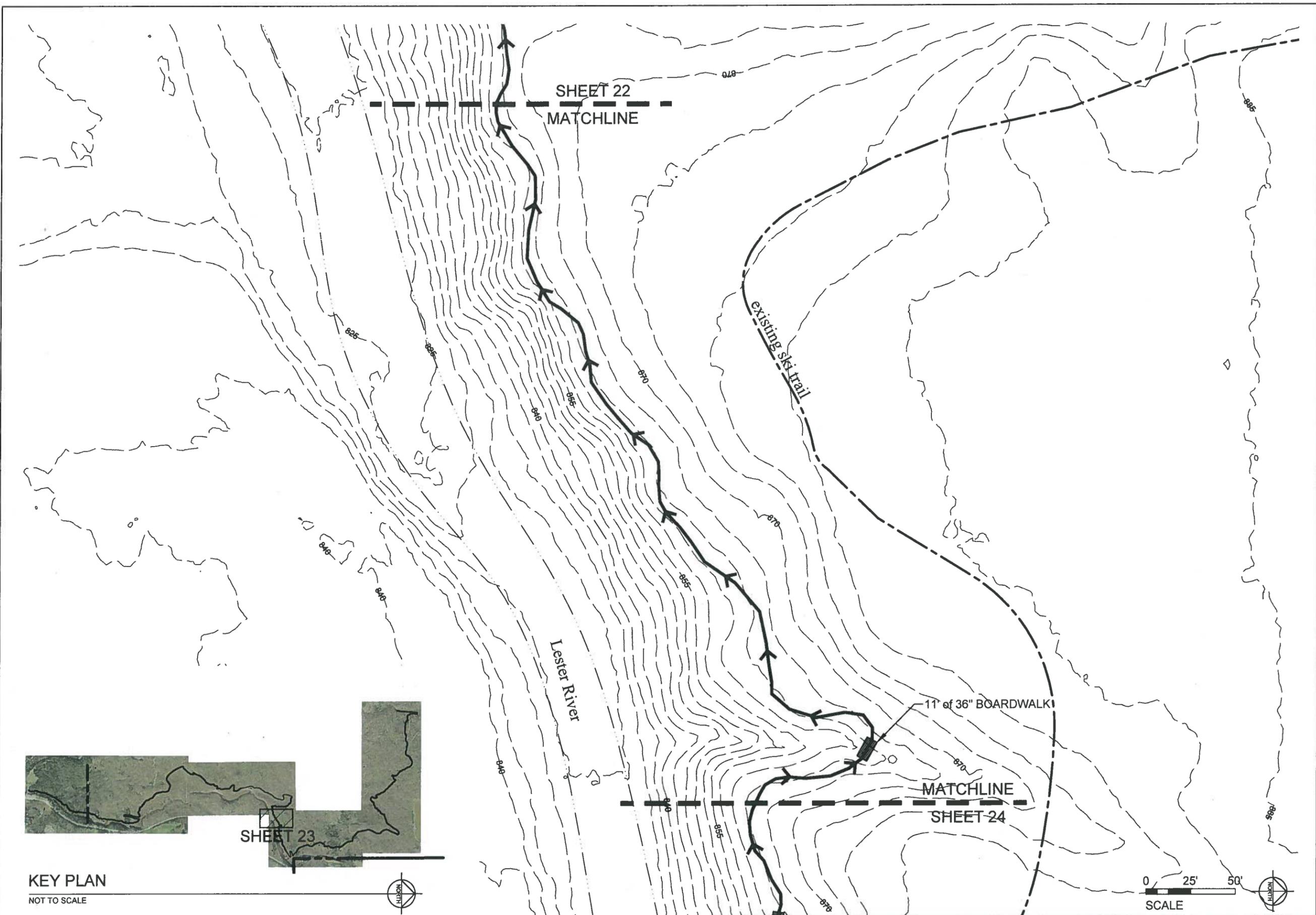
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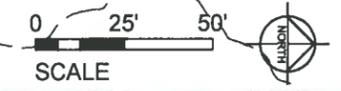
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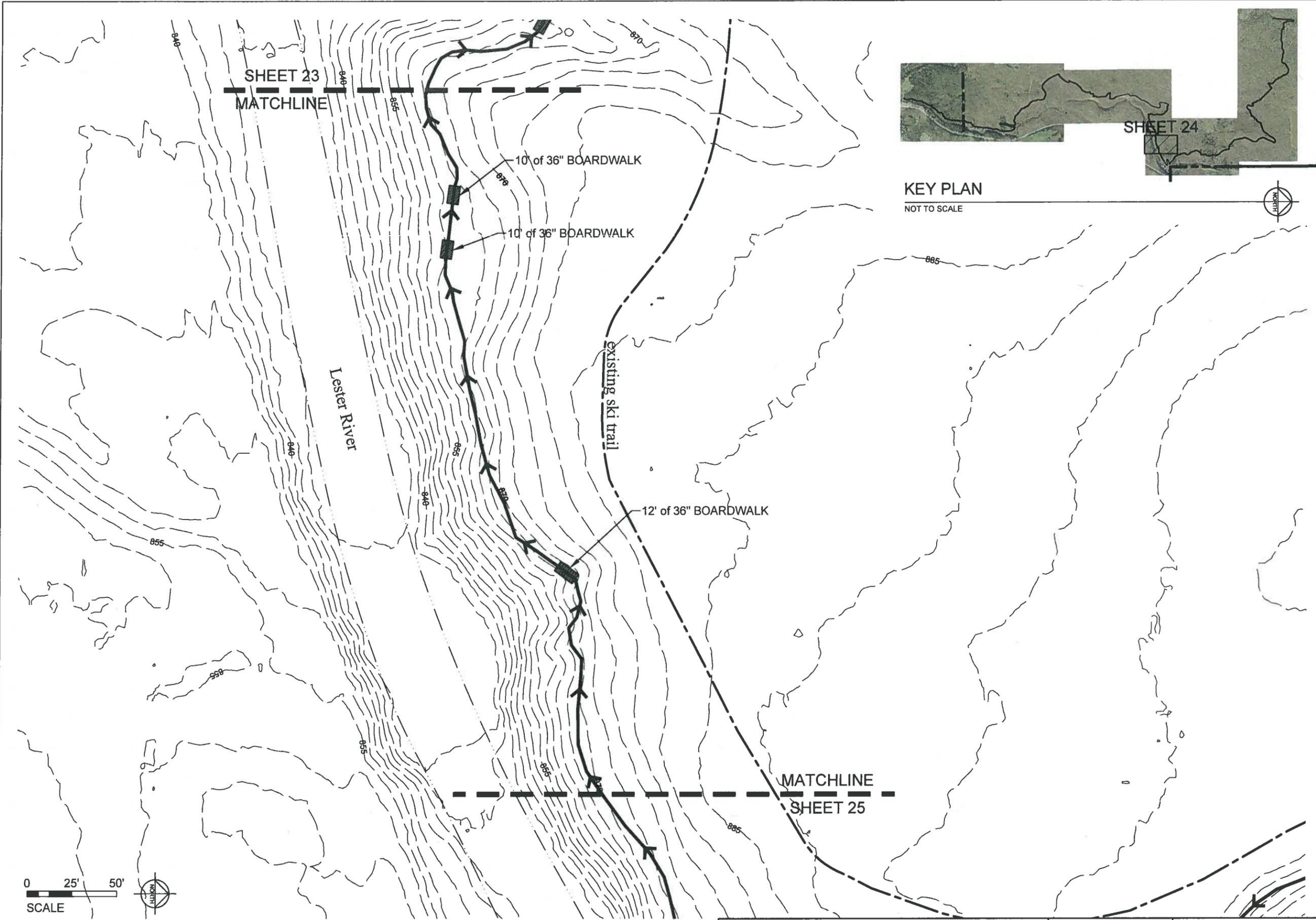
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**23**

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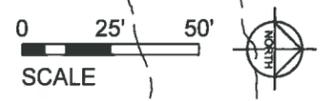
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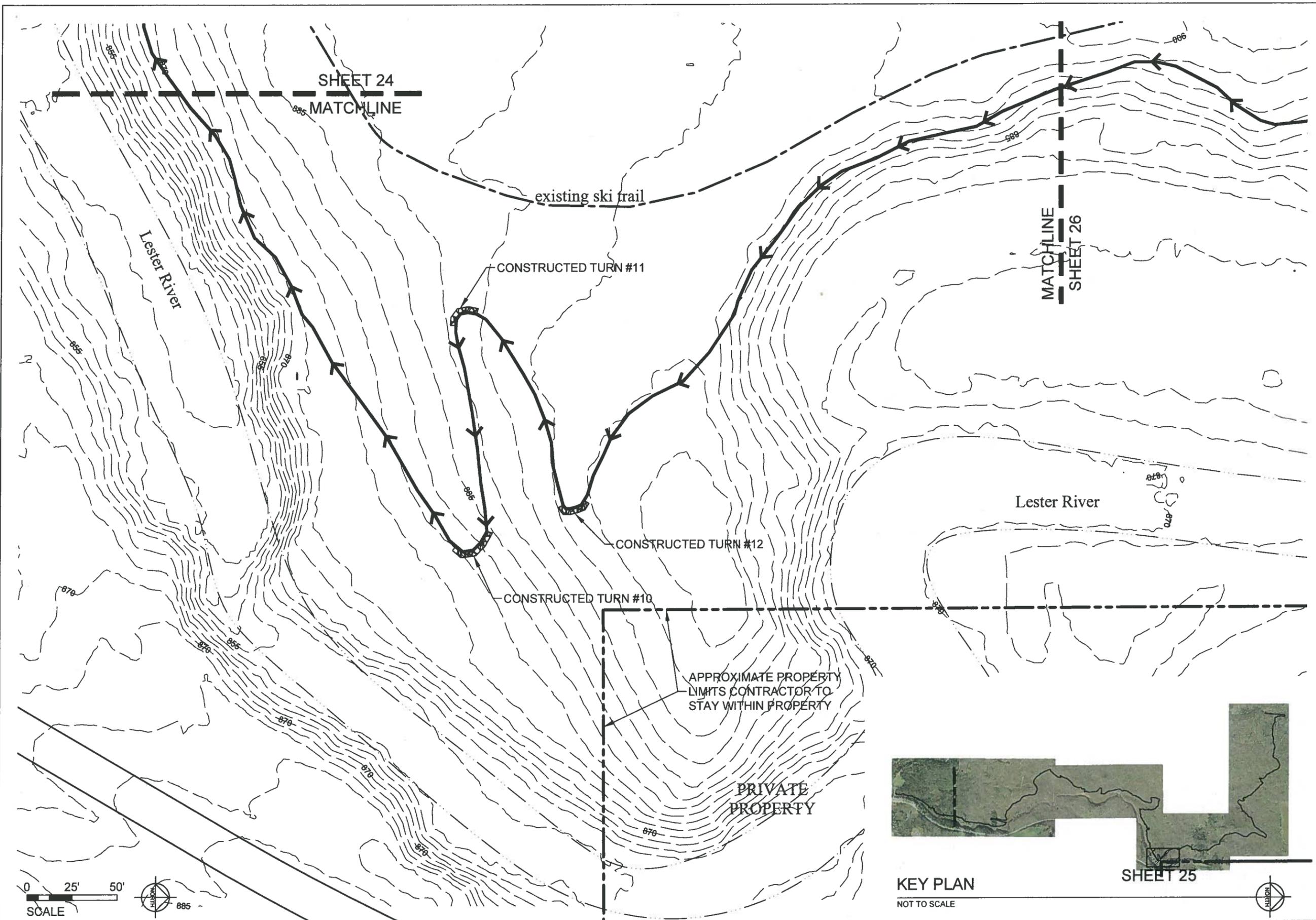
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LANDSCAPE ARCHITECT REG. NO.

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**24**





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**TRAIL PLAN**

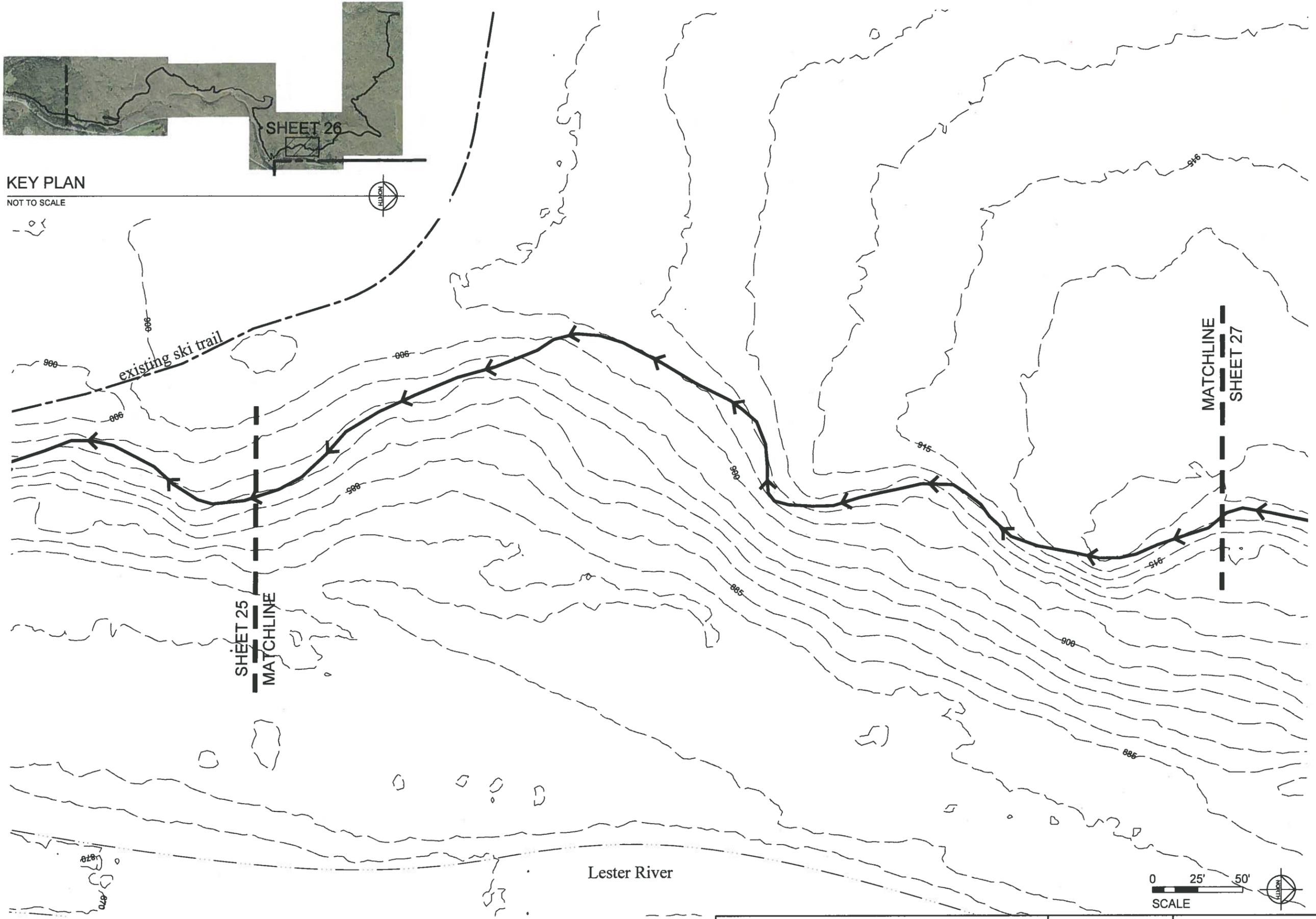


**KEY PLAN**  
 NOT TO SCALE

SHEET 25



**25**



**KEY PLAN**  
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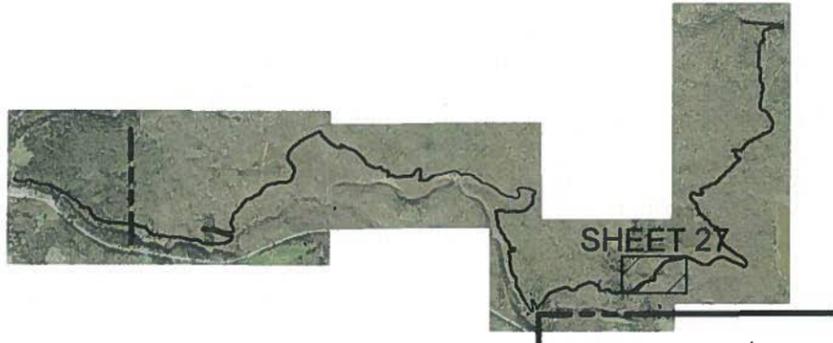
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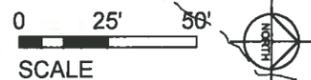
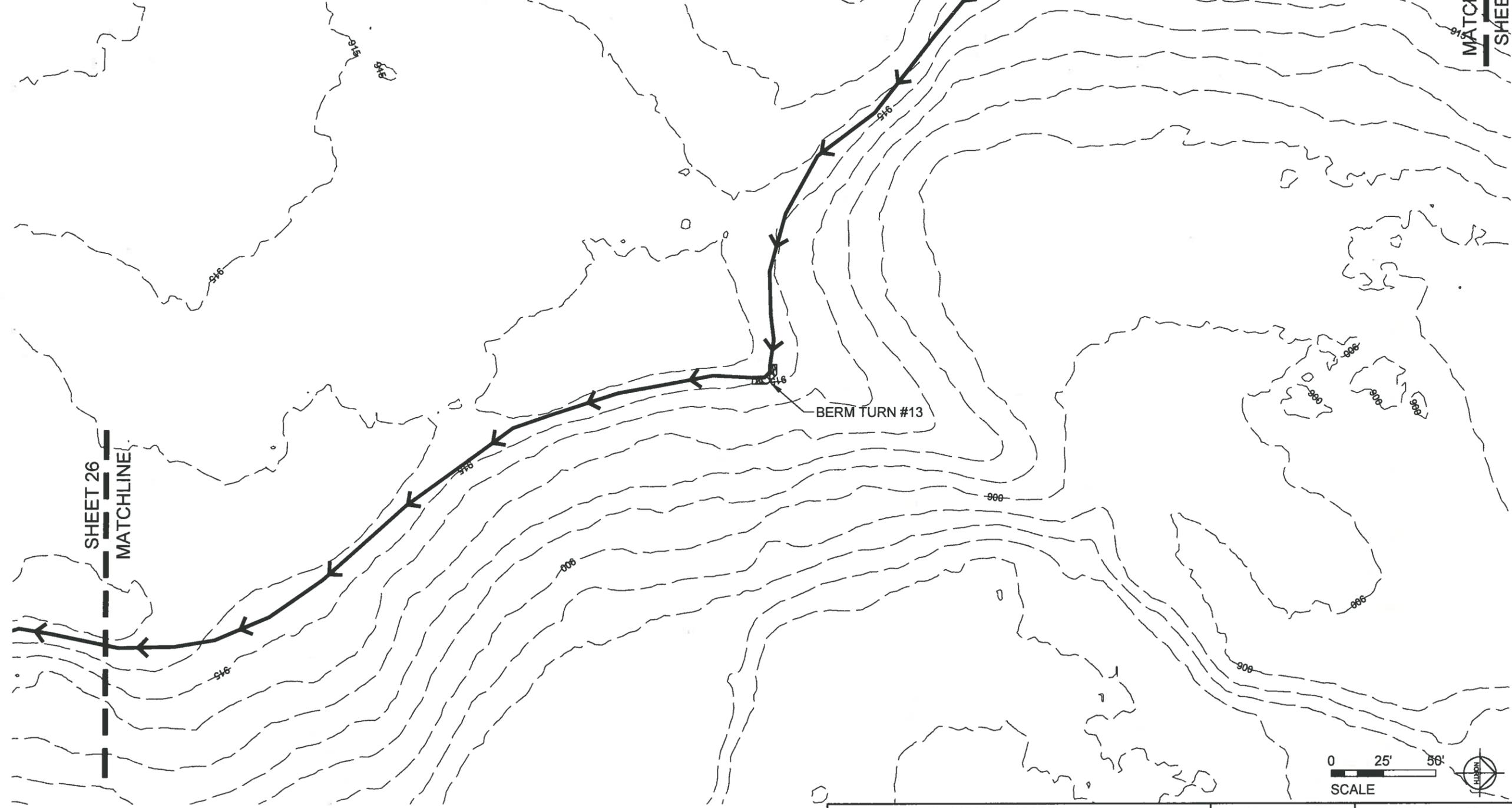
JAMES M. SOBERG 45577  
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**TRAIL PLAN**

**26**



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MATCHLINE  
SHEET 28

SHEET 26  
MATCHLINE

BERM TURN #13

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DULUTH, MINNESOTA 55802  
PHONE: 218-727-8481  
FAX: 218-727-8483  
EMAIL: [archres@cpinternet.com](mailto:archres@cpinternet.com)



**DULUTH  
TRAVERSE  
TRAIL  
LESTER PARK  
PHASE 1**  
DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: MAY-7-2013

DRAWN BY: TTP

REVISIONS:

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

JAMES M. SROBERG 45577  
LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

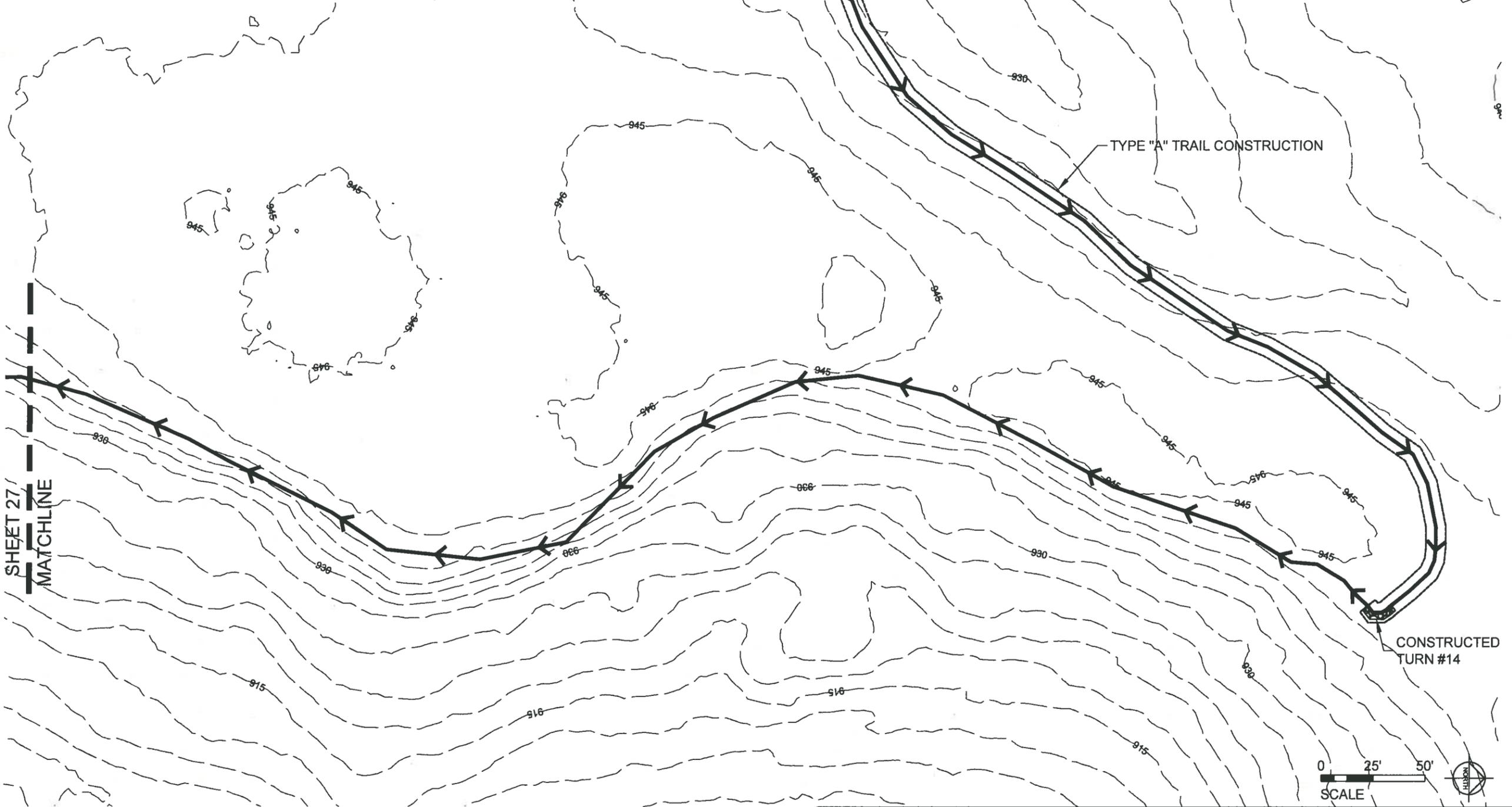
**27**



KEY PLAN  
NOT TO SCALE



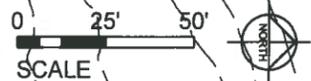
SHEET 29  
MATCHLINE



SHEET 27  
MATCHLINE

TYPE "A" TRAIL CONSTRUCTION

CONSTRUCTED  
TURN #14



- ARCHITECTURE
- ENGINEERING
- LANDSCAPE ARCHITECTURE
- INTERIOR DESIGN

WEB SITE: [www.arimn.com](http://www.arimn.com)  
 126 EAST SUPERIOR STREET  
 DULUTH, MINNESOTA 55802  
 PHONE 218-727-8481  
 FAX 218-727-8483  
 EMAIL: [archres@optnet.net](mailto:archres@optnet.net)



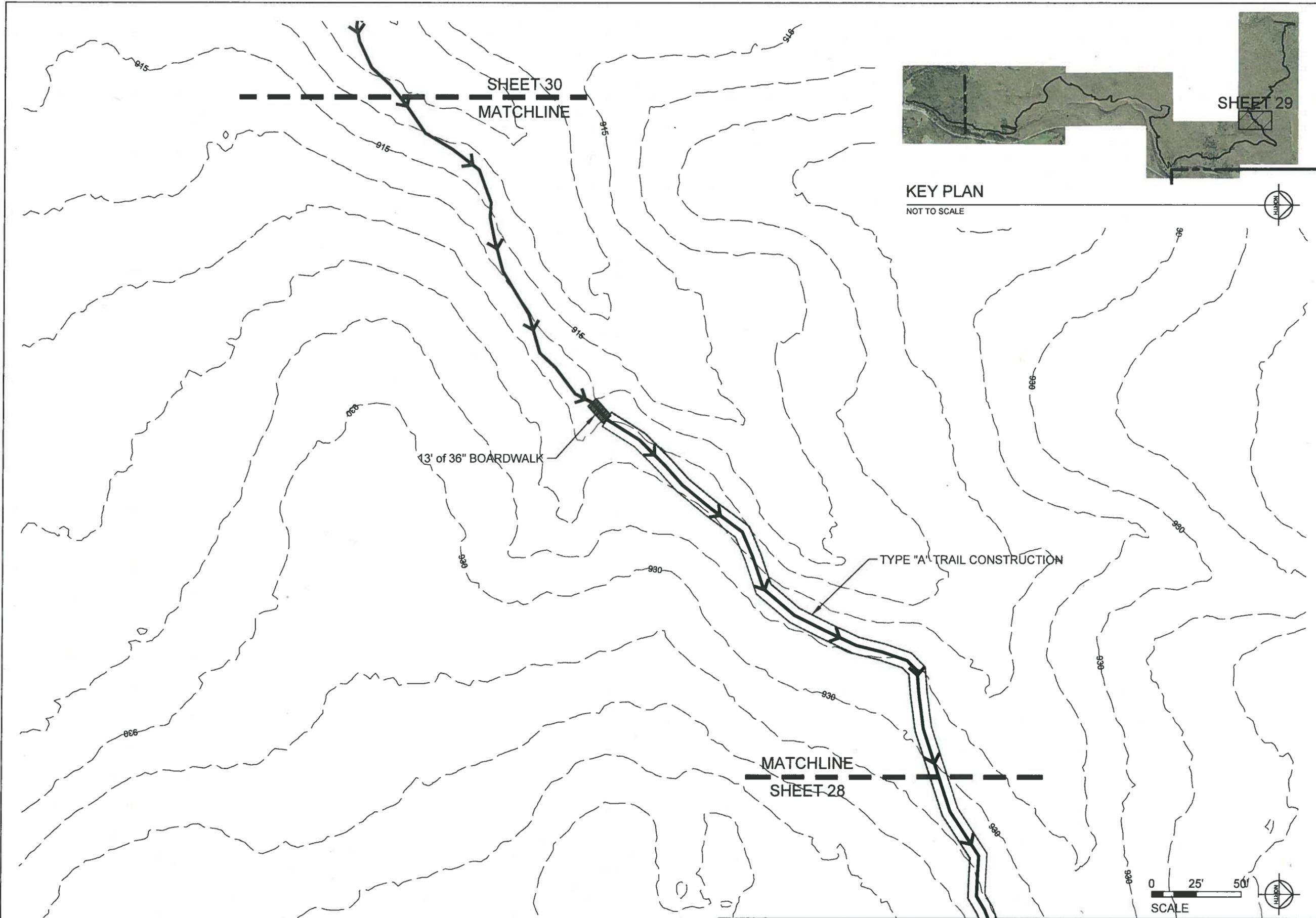
**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
 DULUTH, MINNESOTA

PROJECT NO.:	12-039
DATE:	MAY-7-2013
DRAWN BY:	TTP
REVISIONS:	

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JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**



- ARCHITECTURE
- ENGINEERING
- LANDSCAPE ARCHITECTURE
- INTERIOR DESIGN

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**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
 DULUTH, MINNESOTA

PROJECT NO.: 12-039  
 DATE: MAY-7-2013  
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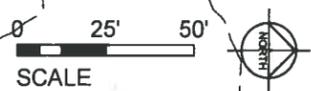
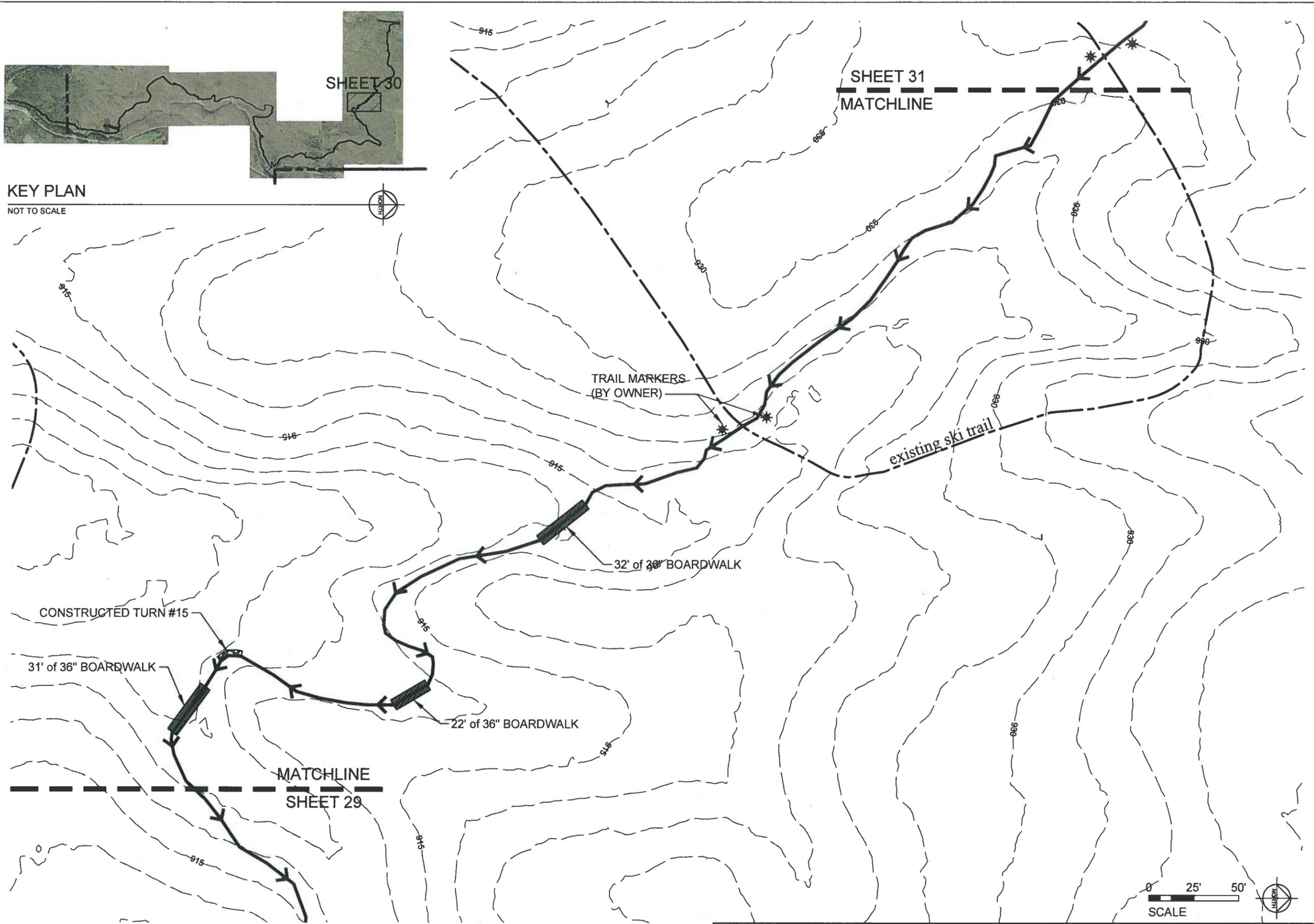
JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT (REG. NO.)

**TRAIL PLAN**



**KEY PLAN**

NOT TO SCALE



**ARCHITECTURAL RESOURCES • INC.**

- ARCHITECTURE
- ENGINEERING
- LANDSCAPE ARCHITECTURE
- INTERIOR DESIGN

WEB SITE: [www.arfmn.com](http://www.arfmn.com)

126 EAST SUPERIOR STREET  
 DULUTH, MINNESOTA 55802  
 PHONE 218-727-8481  
 FAX 218-727-8483  
 EMAIL: [arfmn@earthlink.net](mailto:arfmn@earthlink.net)



**DULUTH TRAVERSE TRAIL LESTER PARK PHASE 1**  
 DULUTH, MINNESOTA

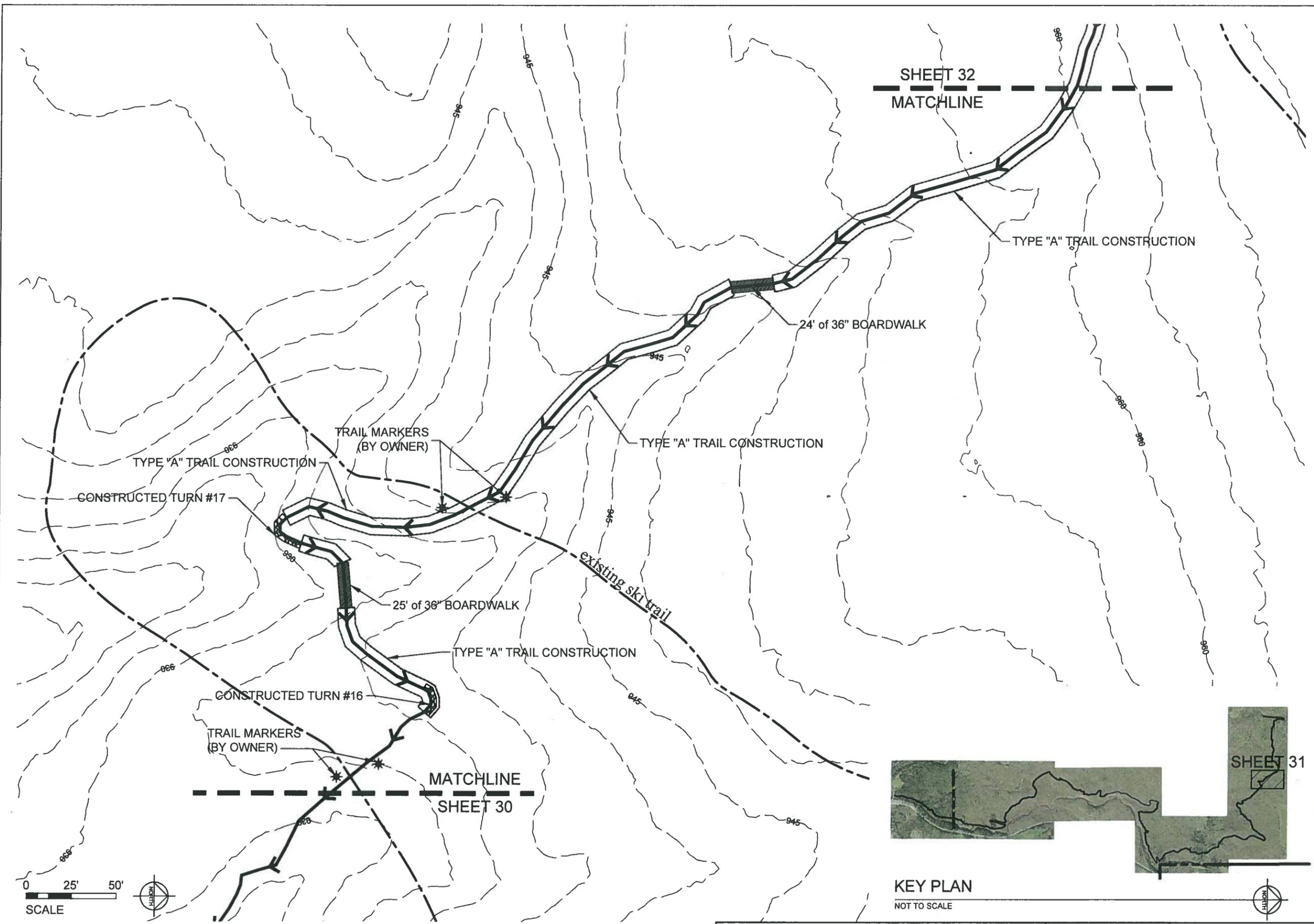
PROJECT NO.: 12-039  
 DATE: MAY-7-2013  
 DRAWN BY: TTP  
 REVISIONS:

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JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

**30**



  
**ARCHITECTURAL  
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- ARCHITECTURE
- ENGINEERING
- LANDSCAPE ARCHITECTURE
- INTERIOR DESIGN

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**DULUTH  
 TRAVERSE  
 TRAIL  
 LESTER PARK  
 PHASE 1**  
 DULUTH, MINNESOTA

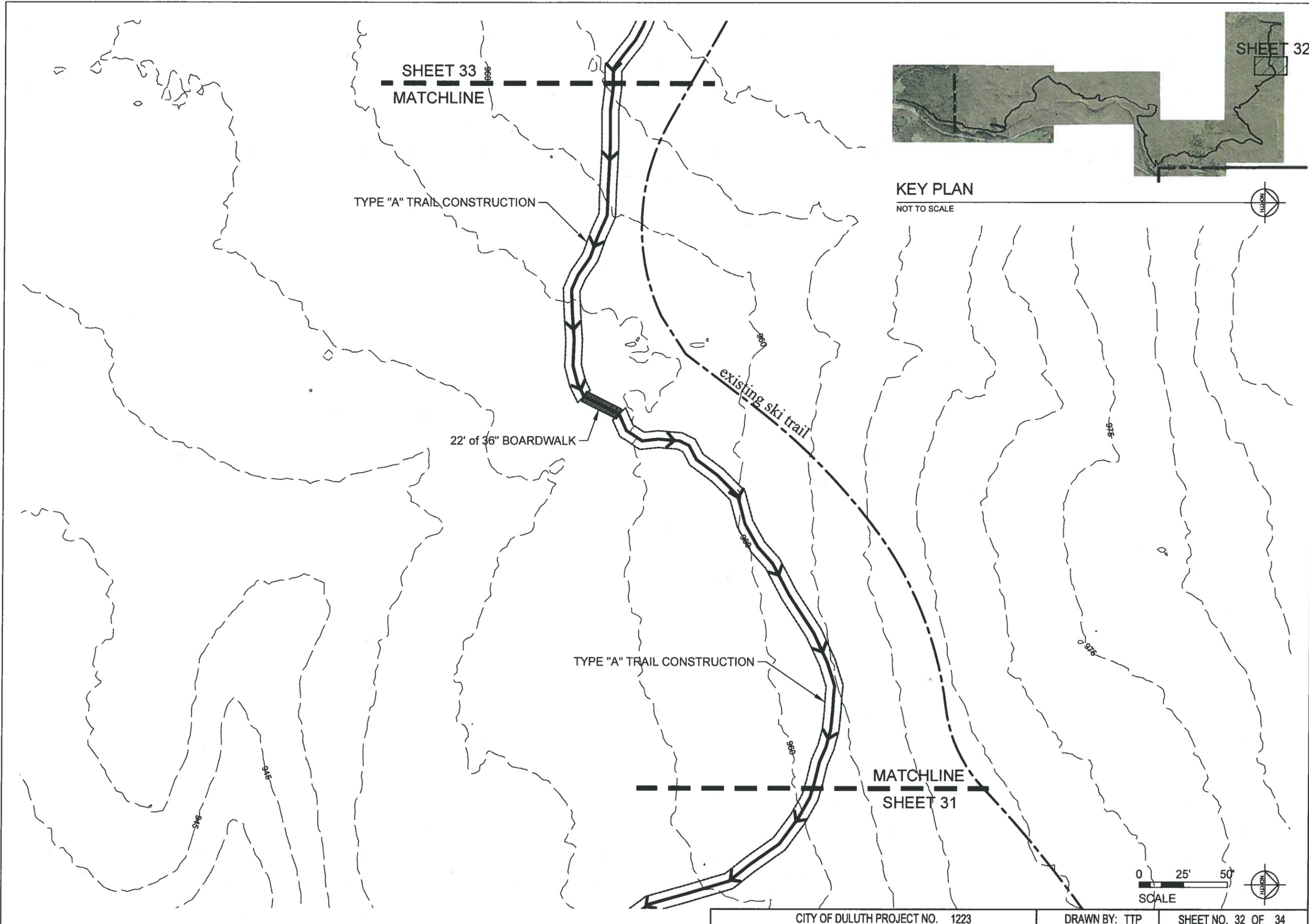
PROJECT NO.:	12-039
DATE:	MAY-7-2013
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**JAMES M. SROBERG** 45577  
 LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

**31**



SHEET 33  
MATCHLINE

TYPE "A" TRAIL CONSTRUCTION

22' of 36" BOARDWALK

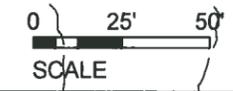
TYPE "A" TRAIL CONSTRUCTION

existing ski trail

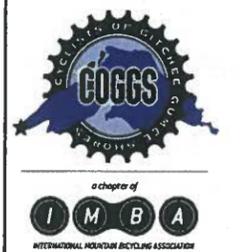
MATCHLINE  
SHEET 31



KEY PLAN  
NOT TO SCALE



  
**ARCHITECTURAL  
 RESOURCES • INC.**  
 • ARCHITECTURE  
 • ENGINEERING  
 • LANDSCAPE ARCHITECTURE  
 • INTERIOR DESIGN  
 WEB SITE: [www.arin.com](http://www.arin.com)  
 126 EAST SUPERIOR STREET  
 DULUTH, MINNESOTA 55802  
 PHONE: 218-727-8481  
 FAX: 218-727-8483  
 EMAIL: [arohres@optinet.net](mailto:arohres@optinet.net)



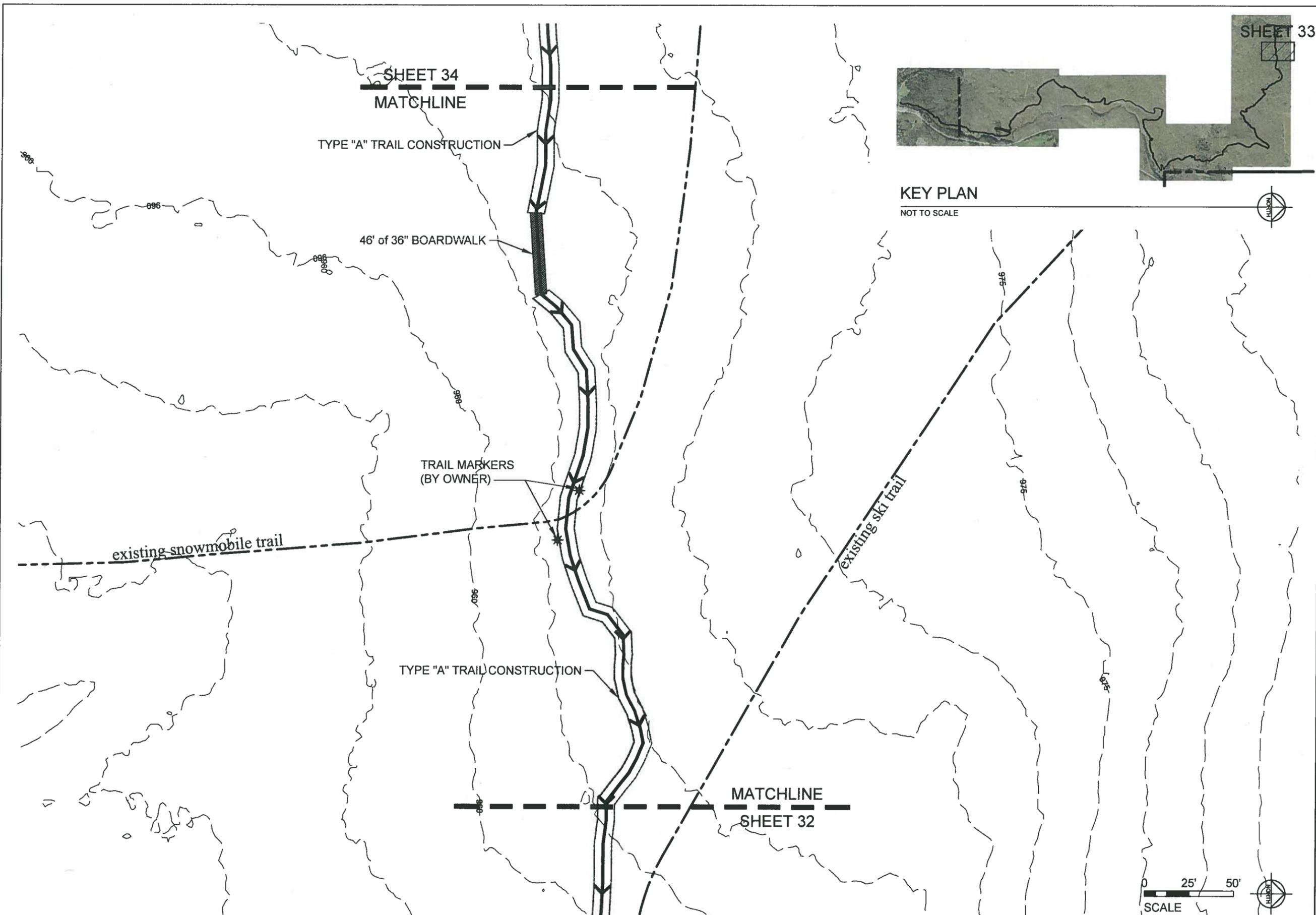
**DULUTH  
 TRAVERSE  
 TRAIL  
 LESTER PARK  
 PHASE 1**  
 DULUTH, MINNESOTA

PROJECT NO.: 12-039  
 DATE: MAY-7-2013  
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 JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

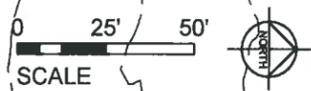


KEY PLAN  
NOT TO SCALE

SHEET 33

SHEET 34  
MATCHLINE

MATCHLINE  
SHEET 32



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- ENGINEERING
- LANDSCAPE ARCHITECTURE
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a chapter of  
**I M B A**  
INTERNATIONAL BIKEWAY ASSOCIATION

**DULUTH TRAVERSE TRAIL  
LESTER PARK  
PHASE 1  
DULUTH, MINNESOTA**

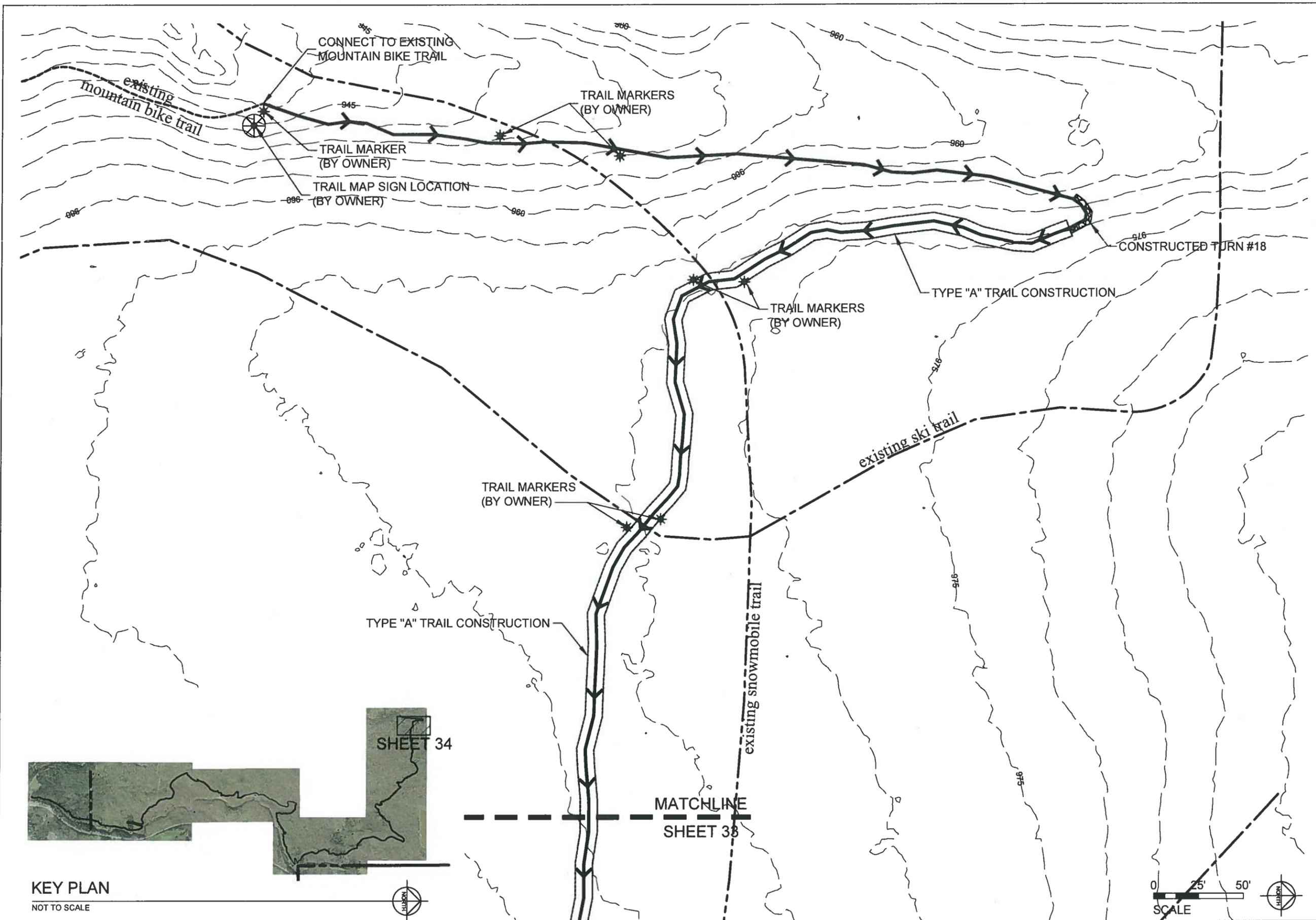
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DATE:	MAY-7-2013
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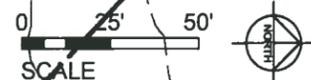
**JAMES M. BERGBERG** 45577  
LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

**33**



KEY PLAN  
NOT TO SCALE



**ARCHITECTURAL  
RESOURCES • INC.**

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- ENGINEERING
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JAMES M. SROBERG 45577  
 LANDSCAPE ARCHITECT REG. NO.

**TRAIL PLAN**

**34**