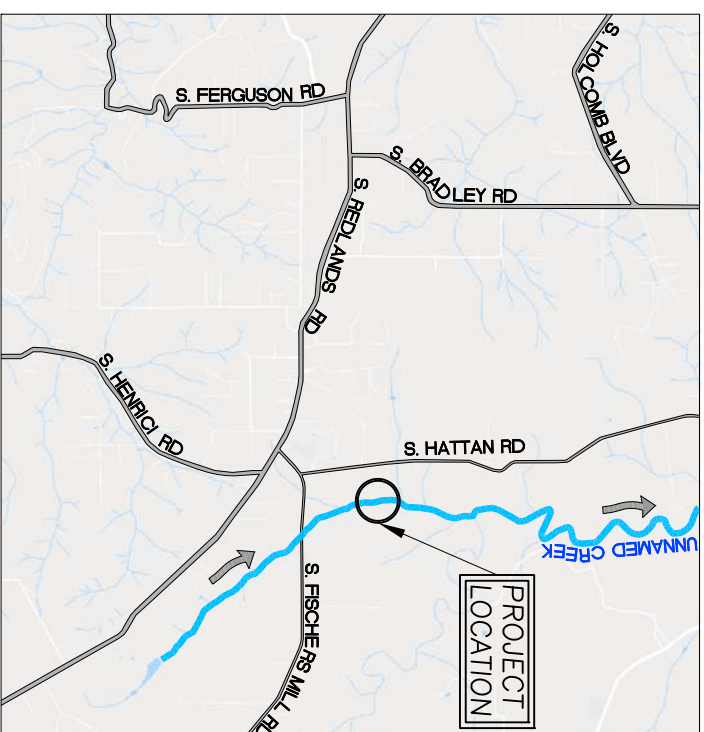
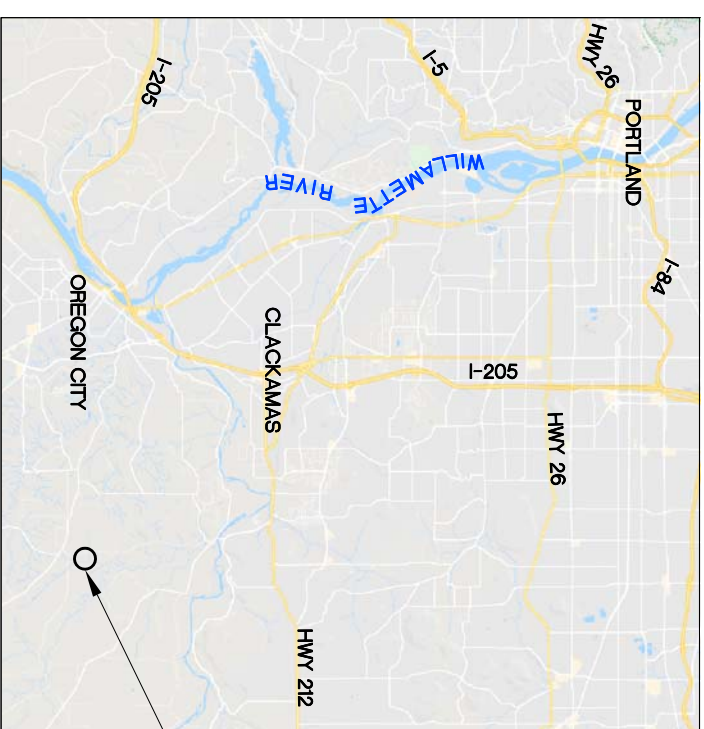


# DELANO FARMS CULVERT REPLACEMENT PROJECT

## 100% DESIGN SUBMITTAL



VICINITY MAP  
N.T.S. (GOOGLE)



REGIONAL MAP  
N.T.S. (GOOGLE)

### SHEET INDEX

- C1 COVER
- C2 ACCESS AND STAGING PLAN
- C3 EXISTING CONDITIONS PLAN
- C4 SITE PLAN AND CREEK PROFILE
- C5 CREEK SECTIONS
- C6 CREEK SECTIONS
- C7 ROAD PROFILE AND TYPICAL SECTIONS
- C8 EROSION CONTROL AND DEMATERING PLAN
- C9 NOTES AND DETAIL

### PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 100% DESIGN LEVEL DETAILS FOR THE REPLACEMENT OF AN EXISTING UNDER-SIZED CULVERT FOR AN UNNAMED TRIBUTARY OF CLEAR CREEK LOCATED NORTH OF REDLAND, OREGON IN CLACKAMAS COUNTY.  
WORK SHALL CONSIST OF REMOVAL AND DISPOSAL OF THE EXISTING CULVERT AND REPLACEMENT WITH ARCH PIPE CULVERT WITH NATURAL STREAMBED MATERIAL.

### ABBREVIATIONS

|        |   |        |                         |
|--------|---|--------|-------------------------|
| AVG.   | AVERAGE                                   | RC     | RELATIVE COMPACTION     |
| CC     | CONCRETE                                  | RSP    | ROCK SLOPE PROTECTION   |
| CLSM   | CONTROLLED LOW STRENGTH MATERIAL CONCRETE | SPK    | SPIKE                   |
| CY     | CUBIC YARDS                               | SQ.FT. | SQUARE FOOT             |
| DIA.   | DIAMETER                                  | T      | TREE                    |
| E      | EXISTING                                  | T.B.D. | TO BE DETERMINED        |
| EG     | EXISTING GROUND ELEVATION                 | UNK    | UNKNOWN                 |
| DI     | DRAINAGE INLET                            | WSE    | WATER SURFACE ELEVATION |
| FG     | FINISHED GRADE                            | YR     | YEAR                    |
| FT     | FEET                                      |        |                         |
| INV    | INVERT                                    |        |                         |
| N      | NEW                                       |        |                         |
| NIC    | NOT IN CONTRACT                           |        |                         |
| N.T.S. | NOT TO SCALE                              |        |                         |
| O.C.   | ON CENTER                                 |        |                         |

### GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY: UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE SURVEY DATES: 10/31/17 AND 01/18/18.
2. ELEVATION DATUM: NAVD83.
3. HORIZONTAL DATUM: NAD83 OREGON NORTH.
4. AERIAL PHOTO SOURCE: AUTOCAD CIVIL 3D 2016 GEOLLOCATION MAP.
5. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
6. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
7. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF OREGON STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
10. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

### SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION (NUMBER OR LETTER)

REFERENCE SHEET FROM WHICH DETAIL OR SECTION IS TAKEN.



REFERENCE SHEET ON WHICH SECTION OR DETAIL IS SHOWN.

**WATERWAYS CONSULTING INC.**  
1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH:(503)227-5979 // FAX:(888)819-6847  
WWW.WATWAYS.COM

REGISTERED PROFESSIONAL ENGINEER  
77870PE  
OREGON  
JANUARY 3, 2011  
JAKE DYLAN HOFELD  
EXPIRES: 6/30/2019

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

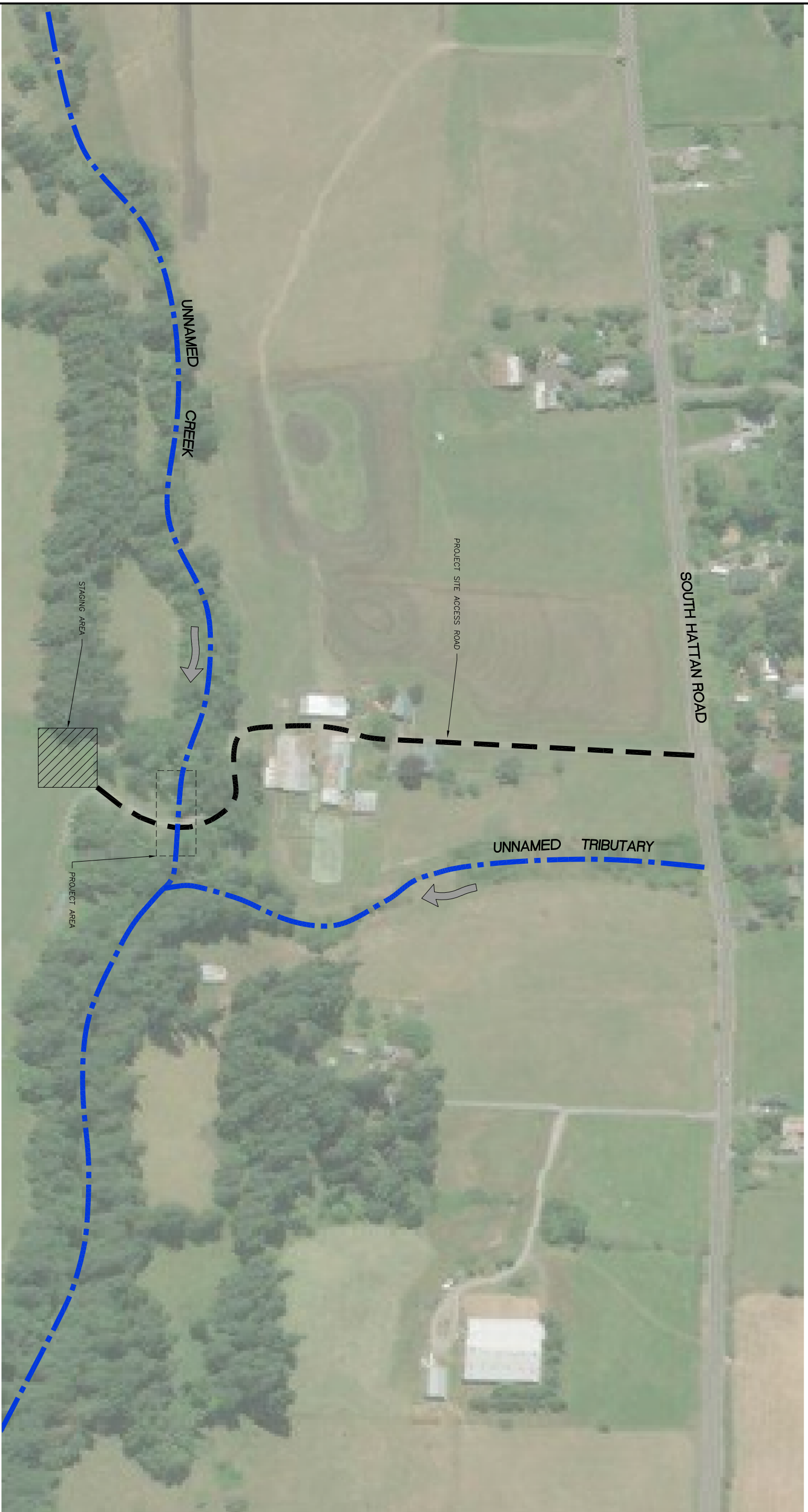
COVER

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**



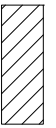
DESIGNED BY: J.H.  
DRAWN BY: D.H.  
CHECKED BY: J.H.  
DATE: 5/2/19  
JOB NO.: 18-059

1 OF 9  
C1

\* CALL BEFORE YOU DIG \*  
CONTACT UNDERGROUND SERVICE ALERT (USA)  
PRIOR TO ANY CONSTRUCTION WORK-1-800-332-2344



**LEGEND**

-  (E) ACCESS ROAD
-  (E) CREEK FLOWLINE
-  STAGING AREA

**ACCESS AND STAGING PLAN**  
SCALE: 1" = 100'

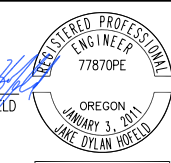
NOTE:  
1. REFER TO EROSION CONTROL NOTES ON SHEET C9 FOR ACCESS AND STAGING AREA RELATED NOTES.

|   |                |
|---|----------------|
| DESIGNED BY: J.H.   | DRAWN BY: D.H. |
| CHECKED BY: J.H.  | DATE: 5/2/19   |
| JOB NO.: 18-059   |                |
| BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS. |                |
| 0   | 1"             |

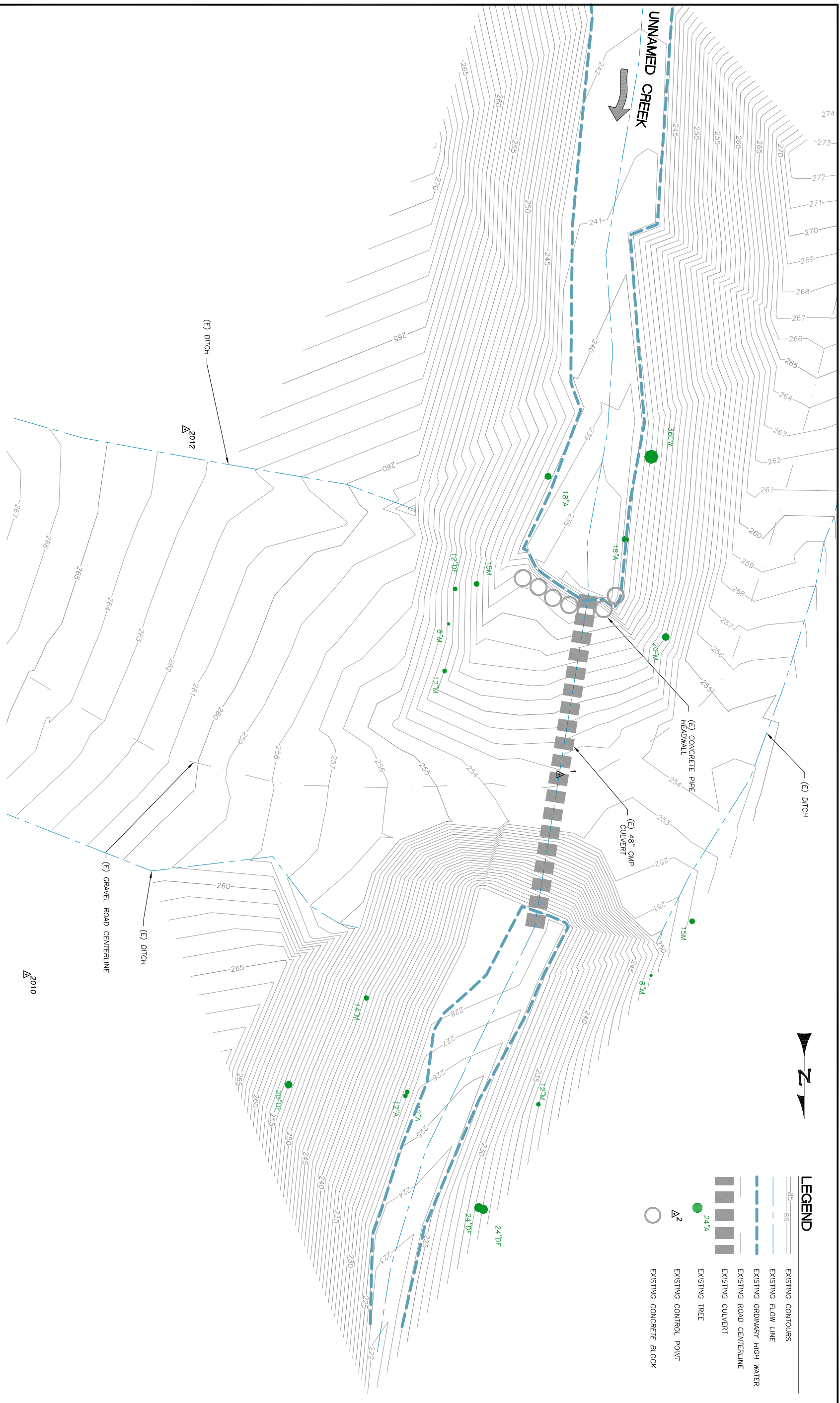
**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

**ACCESS AND STAGING PLAN**

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**


 DATE: 5/2/19  
 JAKE D. HOEFELD

**WATERWAYS CONSULTING INC.**  
 1020 SW TAYLOR STREET, STE. 380  
 PORTLAND, OR 97205  
 PH: (503) 227-5979 // FAX: (888) 819-6847  
 WWW.WATWAYS.COM



**LEGEND**

- EXISTING CONTOURS
- EXISTING FLOW LINE
- EXISTING ORDINARY HIGH WATER
- EXISTING ROAD CENTERLINE
- EXISTING CULVERT
- EXISTING TREE
- EXISTING CONTROL POINT
- EXISTING CONCRETE BLOCK



**CONTROL POINTS**

| POINT | NORTHING   | EASTING   | ELEV.  | DESC. |
|-------|------------|-----------|--------|-------|
| 1     | 7691246.35 | 620692.10 | 253.10 | REBAR |
| 2010  | 7691358.13 | 620734.01 | 269.43 | REBAR |
| 2012  | 7691324.80 | 620619.74 | 263.13 | REBAR |

**EXISTING CONDITIONS PLAN**  
SCALE: 1" = 10'

2010  
2012

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

**EXISTING CONDITIONS PLAN**

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

DESIGNED BY: J.H.  
DRAWN BY: D.H.  
CHECKED BY: J.H.  
DATE: 5/2/19  
JOB NO.: 18-059

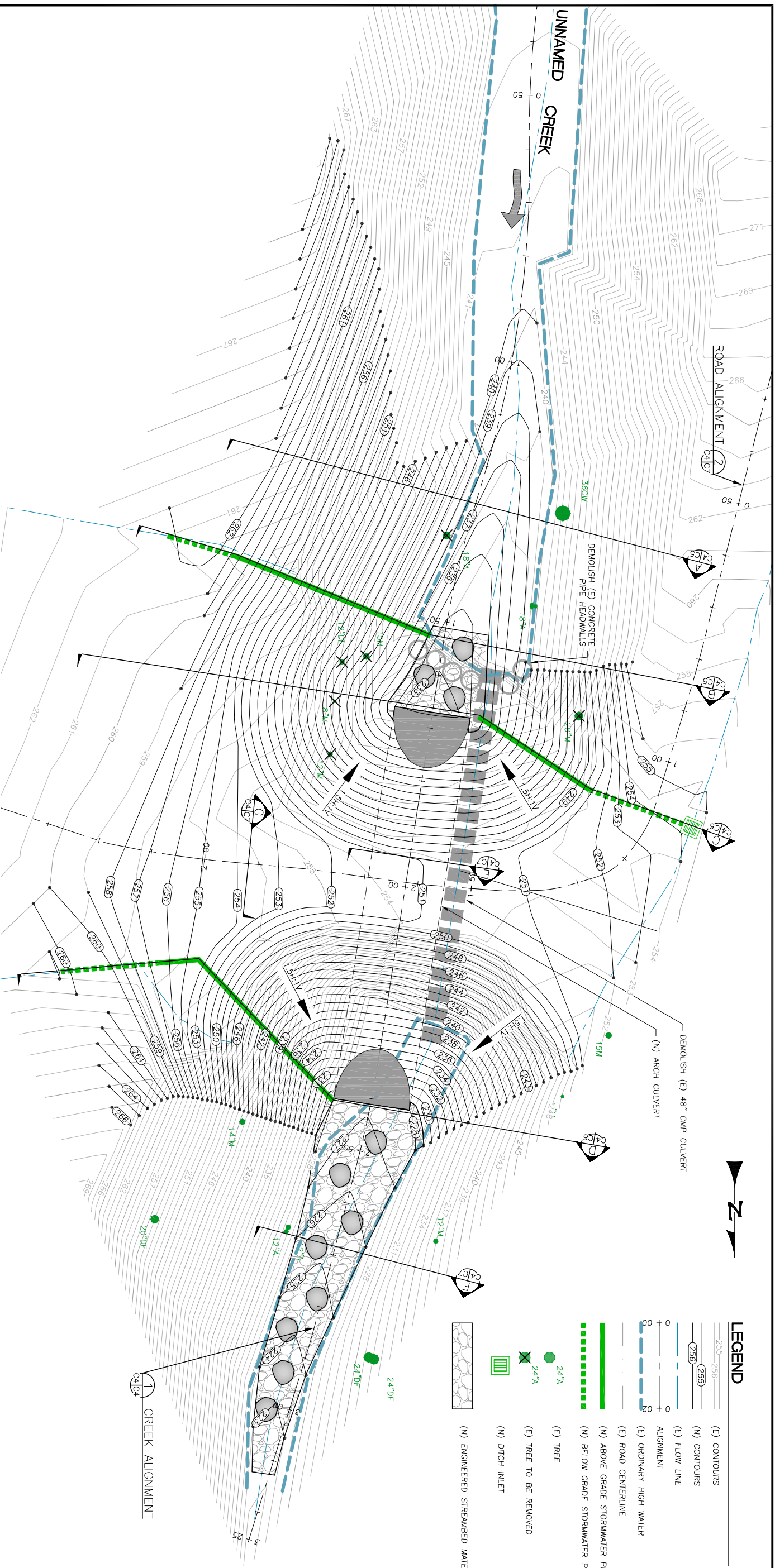
JAKE D. HOEFLD  
REGISTERED PROFESSIONAL ENGINEER  
77870PE  
OREGON  
JANUARY 3, 2011  
JAKE DYLAN HOEFLD  
EXPIRES: 6/30/2019

5/2/19 DATE

**WATERWAYS CONSULTING INC.**

1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH: (503)227-5979 // FAX: (888)819-6847  
WWW.WATWAYS.COM

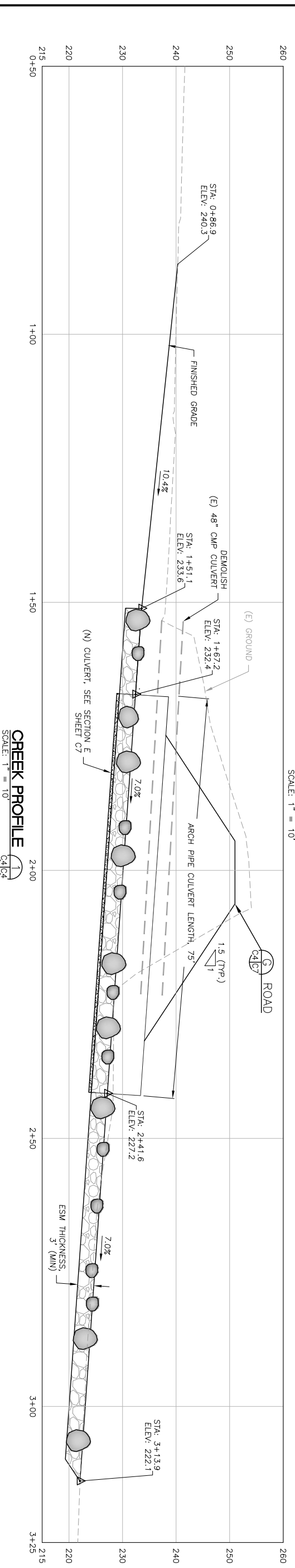




**LEGEND**

- (E) CONTOURS
- (N) CONTOURS
- (E) FLOW LINE
- ALIGNMENT
- (E) ORDINARY HIGH WATER
- (E) ROAD CENTERLINE
- (N) ABOVE GRADE STORMWATER PIPE
- (N) BELOW GRADE STORMWATER PIPE
- (E) TREE
- (E) TREE TO BE REMOVED
- (N) DITCH INLET
- (N) ENGINEERED STREAMBED MATERIAL

**SITE PLAN**  
SCALE: 1" = 10'



**CREEK PROFILE**  
SCALE: 1" = 10'

**WATERWAYS CONSULTING INC.**  
1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH: (503) 227-5979 // FAX: (888) 819-6847  
WWW.WATWAYS.COM

DATE: 5/2/19  
  
 JAKE D. HOEFELD

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

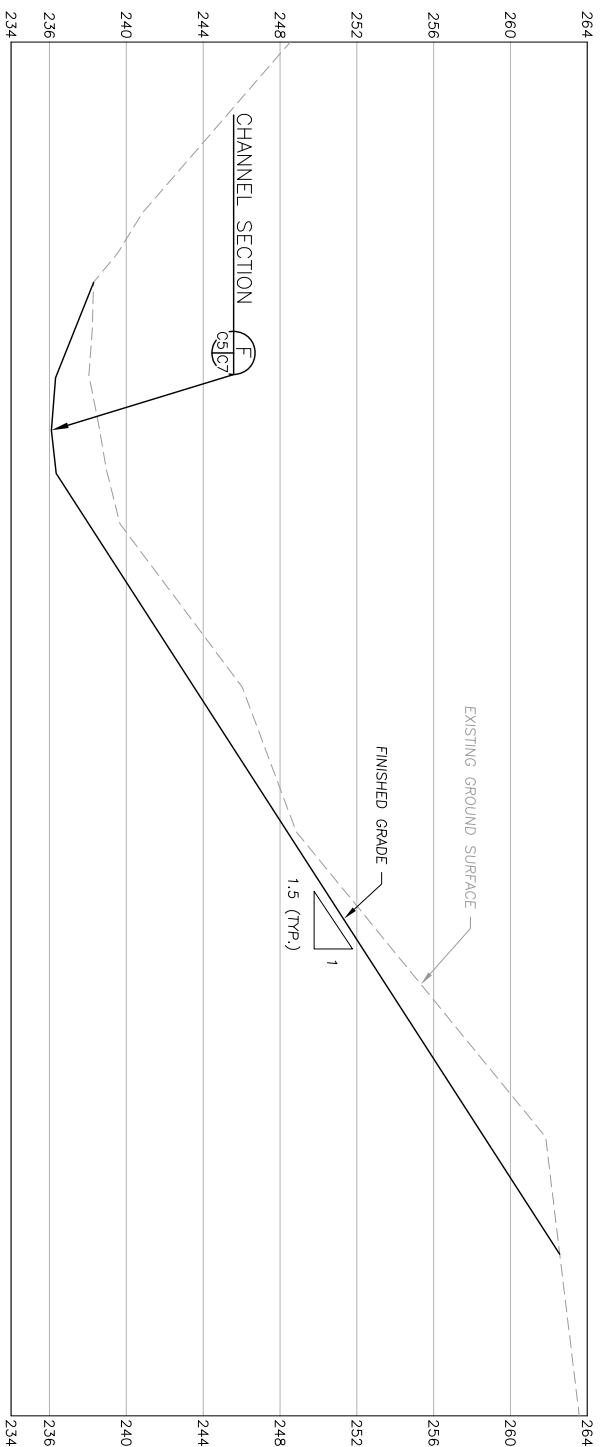
**SITE PLAN AND CREEK PROFILE**

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

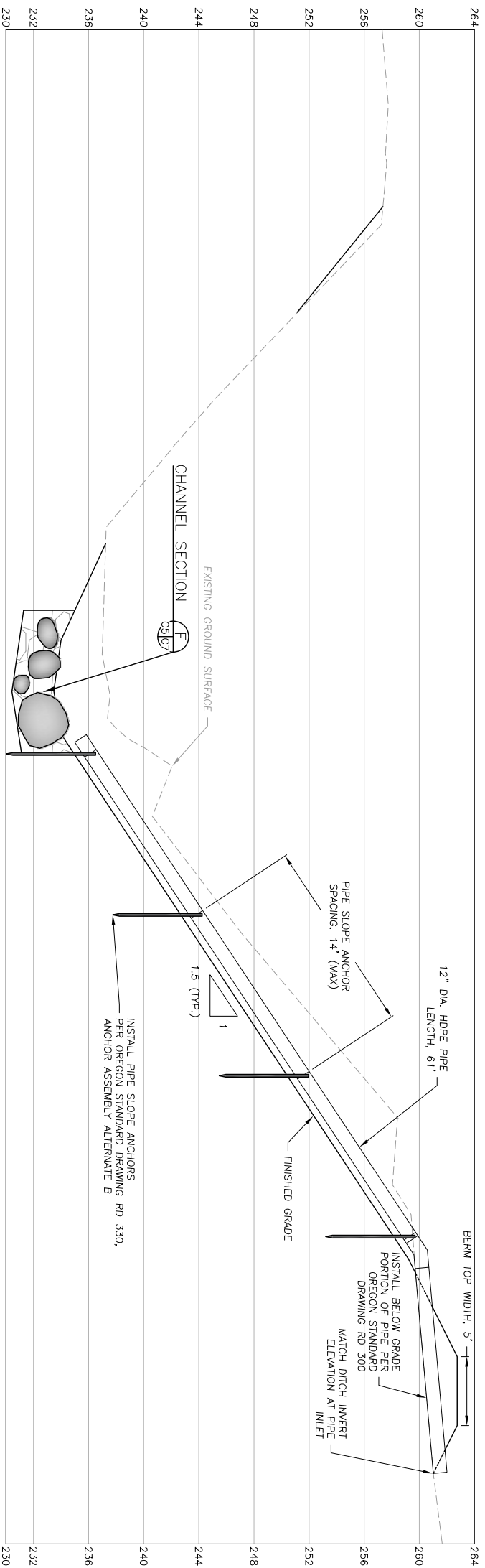
DESIGNED BY: J.H.  
 DRAWN BY: D.H.  
 CHECKED BY: J.H.  
 DATE: 5/2/19  
 JOB NO.: 18-059

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

C4 OF 9



STATION 1427 SECTION (A)  
SCALE: 1" = 5'



STATION 1453 SECTION (B)  
SCALE: 1" = 5'

**WATERWAYS**  
CONSULTING INC.  
1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH: (503) 227-5979 // FAX: (888) 819-6847  
WWW.WATWAYS.COM

REGISTERED PROFESSIONAL ENGINEER  
77870PE  
OREGON  
JANUARY 1, 2011  
JAKE DYLAN HOEFLD  
EXPIRES: 6/30/2019  
DATE: 5/2/19  
JAKE D. HOEFLD

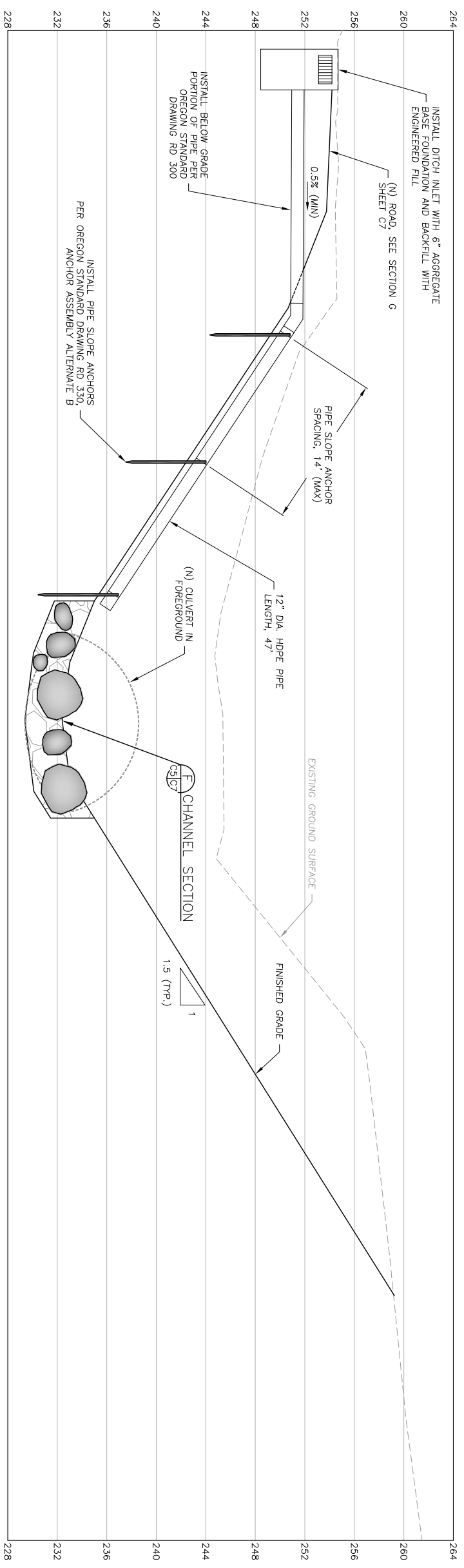
PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

**CREEK SECTIONS**

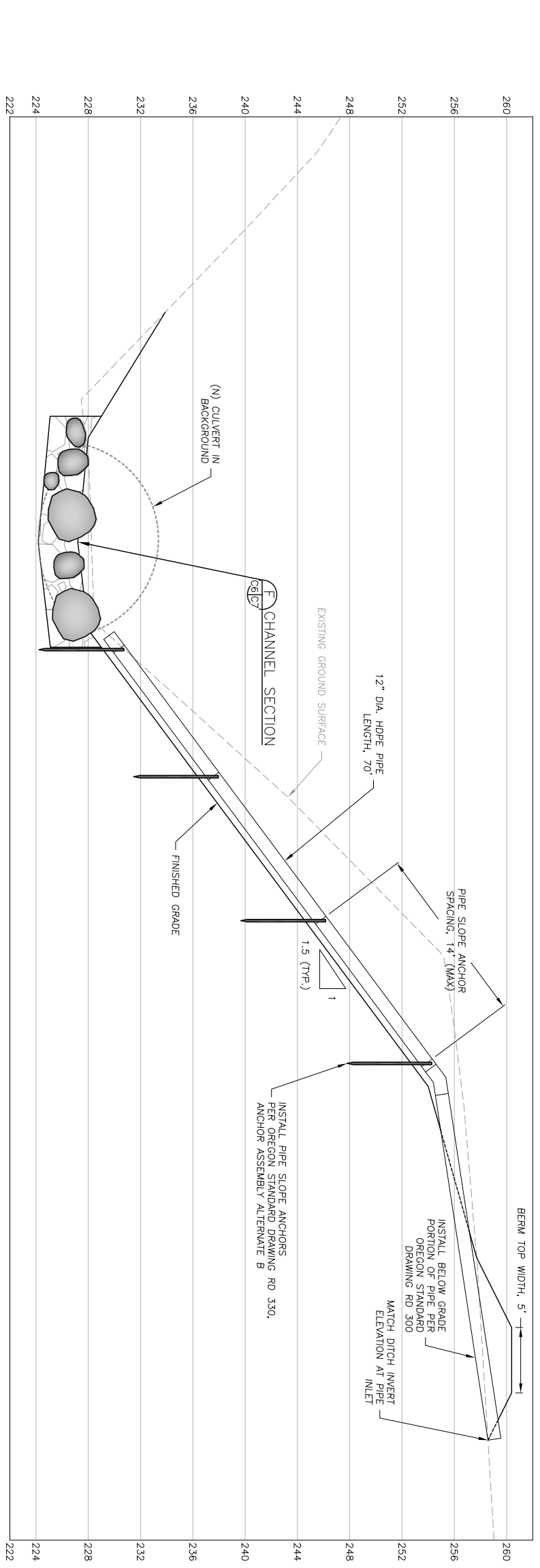
**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

DESIGNED BY: J.H.  
DRAWN BY: D.H.  
CHECKED BY: J.H.  
DATE: 5/2/19  
JOB NO.: 18-059

5 OF 9  
C5  
0 1"



STATION 1467 SECTION  
SCALE: 1" = 5'



STATION 2142 SECTION  
SCALE: 1" = 5'

**WATERWAYS CONSULTING INC.**  
1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH: (503) 227-5979 // FAX: (888) 819-6847  
WWW.WATWAYS.COM

REGISTERED PROFESSIONAL ENGINEER  
77870PE  
JAKE D. HOFELD  
OREGON  
JANUARY 1, 2011  
JAKE DYLAN HOFELD  
EXPIRES: 6/30/2019  
DATE: 5/2/19

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

**CREEK SECTIONS**

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

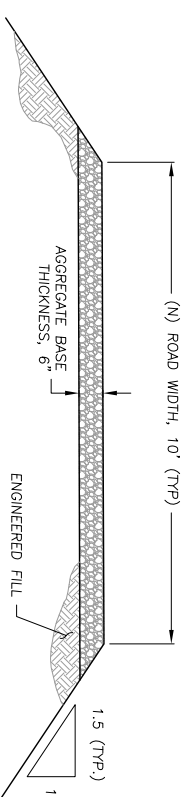
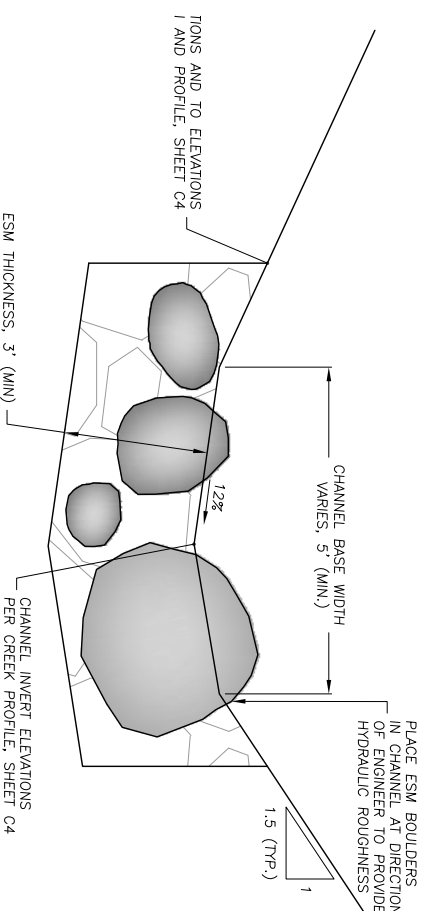
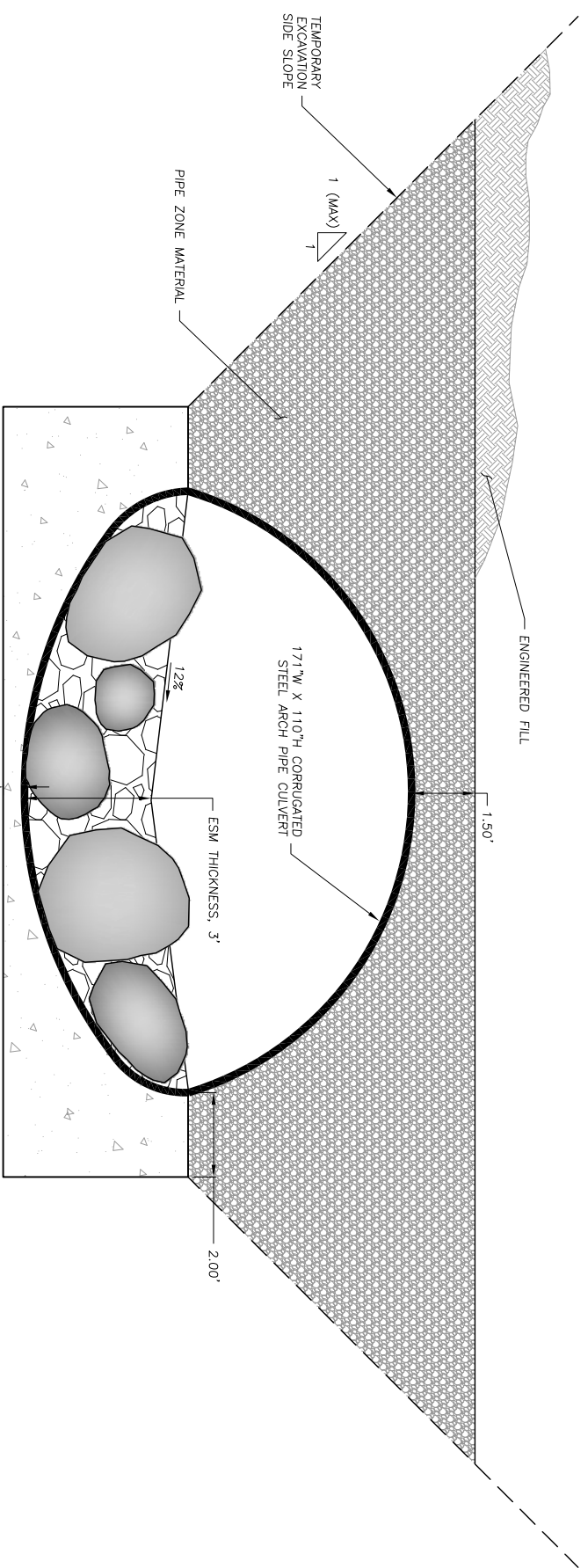
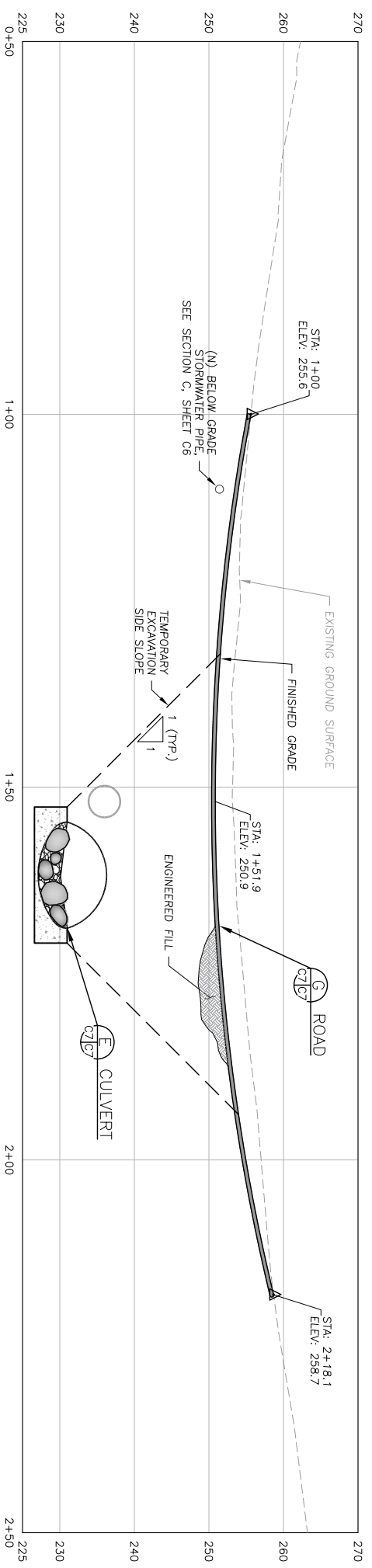
DESIGNED BY: J.H.  
DRAWN BY: D.H.  
CHECKED BY: J.H.  
DATE: 5/2/19  
JOB NO.: 18-059

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

0 1" 1"

C5 OF 9





**WATERWAYS CONSULTING INC.**  
1020 SW TAYLOR STREET, STE. 380  
PORTLAND, OR 97205  
PH: (503) 227-5979 // FAX: (888) 819-6847  
WWW.WATWAYS.COM

REGISTERED PROFESSIONAL ENGINEER  
77870PE  
JAKE D. HOFELD  
OREGON  
JANUARY 3, 2011  
JAKE DYLAN HOFELD  
EXPIRES: 6/30/2019  
DATE: 5/2/19

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

**ROAD PROFILE AND TYPICAL SECTIONS**

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

DESIGNED BY: J.H.  
DRAWN BY: D.H.  
CHECKED BY: J.H.  
DATE: 5/2/19  
JOB NO.: 18-059

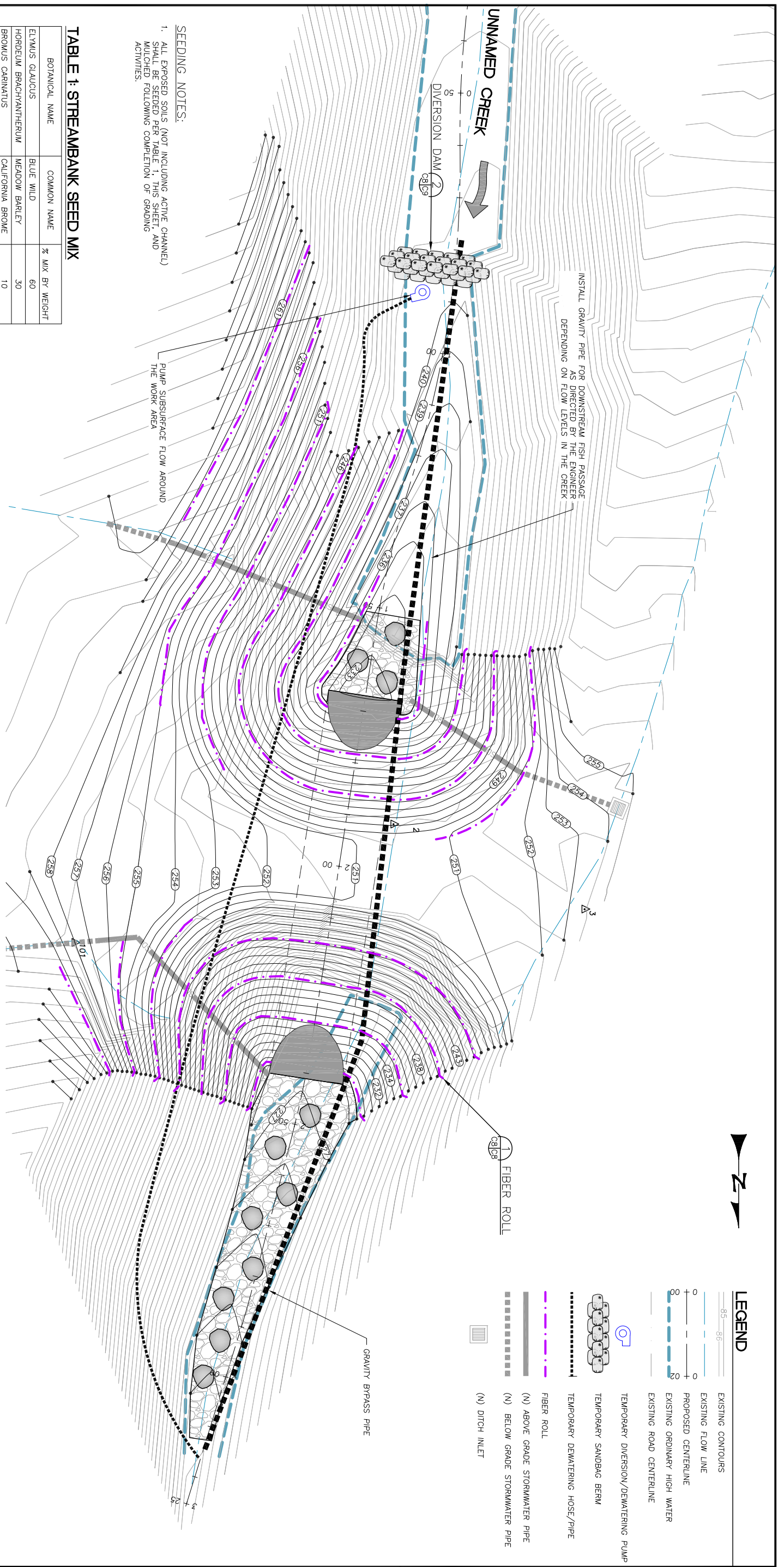
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

C7 OF 7  
9



**LEGEND**

- EXISTING CONTOURS
- EXISTING FLOW LINE
- PROPOSED CENTERLINE
- EXISTING ORDINARY HIGH WATER
- EXISTING ROAD CENTERLINE
- TEMPORARY DIVERSION/DEWATERING PUMP
- TEMPORARY SANDBAG BERM
- TEMPORARY DEWATERING HOSE/PIPE
- FIBER ROLL
- (N) ABOVE GRADE STORMWATER PIPE
- (N) BELOW GRADE STORMWATER PIPE
- (N) DITCH INLET

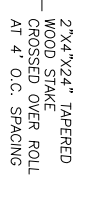


**SEEDING NOTES:**  
 1. ALL EXPOSED SOILS (NOT INCLUDING ACTIVE CHANNEL) SHALL BE SEEDED PER TABLE 1, THIS SHEET, AND MULCHED FOLLOWING COMPLETION OF GRADING ACTIVITIES.

**TABLE 1: STREAMBANK SEED MIX**

| BOTANICAL NAME         | COMMON NAME      | % MIX BY WEIGHT |
|------------------------|------------------|-----------------|
| ELYMUS GLAUCUS         | BLUE WILD        | 60              |
| HORDEUM BRACHYANTHERUM | MEADOW BARLEY    | 30              |
| BROMUS CARINATUS       | CALIFORNIA BROME | 10              |

APPLY AT A RATE OF 44 LBS. PER ACRE WITHIN AREA OF DISTURBANCE.



**FIBER ROLL NOTES**

- CONSTRUCT TRENCHES TO THE DEPTH SHOWN, AND TO A SUFFICIENT WIDTH TO HOLD THE FIBER ROLL. INSTALL CROSSED STAKES AT THE ON-CENTER SPACING SHOWN ALONG THE LENGTH OF THE FIBER ROLL AND STOPPED AT 12 INCHES FROM EACH END OF THE ROLL. DRIVE STAKES TO BETWEEN TWO AND THREE INCHES ABOVE THE TOP OF THE ROLL.
- PLACE FIBER ROLLS 10 FEET APART ALONG THE SLOPE FOR SLOPE INCLINATION OF 2H:1V AND STEEPER, AND 15 FEET APART FOR THE SLOPE INCLINATION BETWEEN 2H:1V AND 4H:1V.
- CLEAR THE BEDDING AREA FOR THE FIBER ROLL OF OBSTRUCTIONS INCLUDING ROCKS, CLOUDS, AND DEBRIS GREATER THAN ONE INCH IN DIAMETER BEFORE INSTALLATION.
- INSTALL FIBER ROLLS APPROXIMATELY PARALLEL TO THE SLOPE CONTOUR. ANGLE THE TERMINUS OF ROWS UP-SLOPE AT 45 DEGREES FOR A DISTANCE OF THREE FEET. WHERE FIBER ROLLS MEET, PROVIDE AN OVERLAP OF 18 INCHES, WITH ADJACENT ROLLS TIGHTLY ADJUTING EACH OTHER.



**EROSION CONTROL AND DEWATERING PLAN**

SCALE: 1" = 10'

**BOUNDARY FENCE**

SCALE: 1" = 2'

**WATERWAYS CONSULTING INC.**  
 1020 SW TAYLOR STREET, STE. 380  
 PORTLAND, OR 97205  
 PH: (503) 227-5979 // FAX: (888) 819-6847  
 WWW.WATWAYS.COM

DATE: 5/2/19  
 JAKE D. HOEFLD  
 REGISTERED PROFESSIONAL ENGINEER  
 77870PE  
 OREGON  
 JANUARY 3, 2011  
 JAKE DYLAN HOEFLD  
 EXPIRES: 6/30/2019

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

**EROSION CONTROL AND DEWATERING PLAN**

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

DESIGNED BY: J.H.  
 DRAWN BY: D.H.  
 CHECKED BY: J.H.  
 DATE: 5/2/19  
 JOB NO.: 18-059

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

8 OF 9

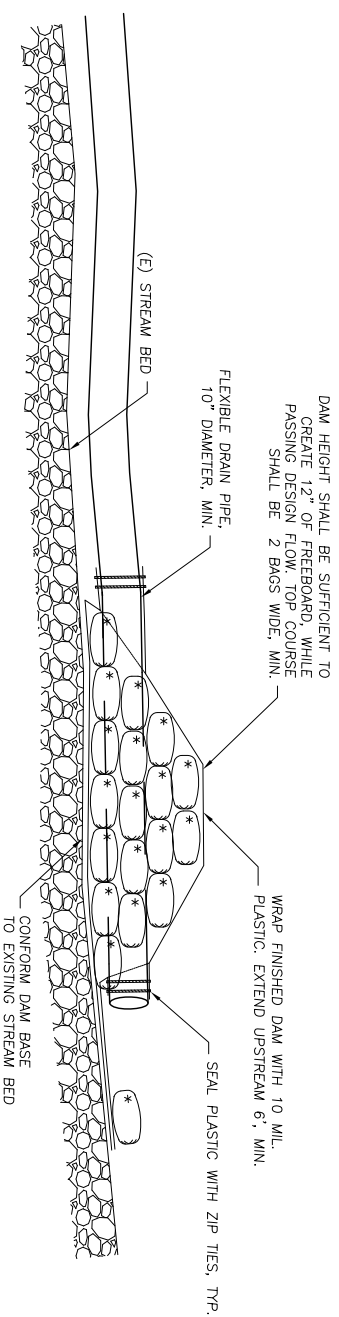


### STREAM/WETLAND CONSTRUCTION BEST MANAGEMENT PRACTICES

1. ALL WORK WITHIN THE WETTED CHANNEL SHALL BE COMPLETED WITHIN THE IN-WATER WORK WINDOW AS LISTED IN THE PERMITS.
2. FISH RELOCATION
  - 2.1. WILL BE PERFORMED BY OTHERS PRIOR TO PERFORMING ANY CONSTRUCTION WITHIN THE WETTED CHANNEL. PROVIDE A MINIMUM OF 2 WEEKS NOTICE OF WORKER FOR WHEN DEWATERING ACTIVITIES ARE EXPECTED TO BEGIN. DEWATERING/BYPASS FLOWS
  - 2.1. PUMPS: WHENEVER A PUMP IS USED TO DEWATER THE ISOLATION AREA AND ESA-LISTED FISH MAY BE PRESENT, A FISH SCREEN WILL BE USED THAT MEETS THE MOST CURRENT VERSION OF NMFS'S FISH SCREEN CRITERIA (NMFS 2011A). NMFS APPROVAL IS REQUIRED FOR PUMPING AT A RATE THAT EXCEEDS 3 CFS.
  - 2.2. TREAT ALL DISCHARGE WATER FROM DEWATERING ACTIVITIES WITHIN THE CONSTRUCTION AREA USING BEST MANAGEMENT PRACTICES TO REMOVE DEBRIS, SEDIMENT, PETROLEUM PRODUCTS, AND ANY OTHER POLLUTANTS LIKELY TO BE PRESENT. DEWATER THE SHORTEST LINEAR EXTENT OF WORK AREA PRACTICABLE.
  - 2.3. FLOW BYPASS SHALL BE PERFORMED AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
  - 2.4. RE-WATERING OF THE WORK AREA FOLLOWING CONSTRUCTION SHALL BE PERFORMED SLOWLY TO PREVENT LOSS OF SURFACE FLOW DOWNSTREAM AND ANY SUDDEN INCREASE IN STREAM TURBIDITY.
3. TEMPORARY STREAM CROSSINGS
  - 3.1. MINIMIZE THE NUMBER OF STREAM CROSSINGS TO MAXIMUM EXTENT PRACTICABLE.
  - 3.2. NO STREAM CROSSINGS SHALL BE ALLOWED IN ACTIVE SPawning SITES, WHEN HOLDING ADULT LISTED FISH ARE PRESENT, OR WHEN EGGS OR ALEVINS ARE IN THE GRAVEL.
  - 3.3. TEMPORARY CROSSINGS SHALL NOT OCCUR IN AREA THAT MAY INCREASE THE RISK OF CHANNEL RE-ROUTING OR AVULSION, OR IN POTENTIAL SPawning HABITAT.
  - 3.4. CONSTRUCTION EQUIPMENT AND VEHICLES SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL.
  - 3.5. CONSTRUCTION EQUIPMENT AND VEHICLES SHALL ONLY BE ALLOWED TO CROSS STREAMS IN THE WET WHERE THE STREAMBED IS BEDROCK, OR WHERE MATS OR OFF-SITE LOGS ARE PLACED IN THE STREAM AND USED AS A CROSSING.
  - 3.6. DECOMMISSION ALL TEMPORARY STREAM CROSSINGS IMMEDIATELY FOLLOWING CONSTRUCTION AND RETURN AREA TO PRECONSTRUCTION CONDITIONS.

### EROSION CONTROL NOTES

1. THE ESCP MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE MEASURES AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS.
2. PASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION.
3. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS.
4. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED.
5. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE BEFORE VEGETATION IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROL.
6. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.
7. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS.
8. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BARS SUCH AS: GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ON-SITE, OR USE AN EXIT TIRE WASH. THESE BARS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES.
9. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE.
10. USE BARS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS, VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE. OTHER CLEANING AND MAINTENANCE ACTIVITIES, THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS.
11. FUELING ACTIVITIES MUST BE LOCATED A MINIMUM OF 150 FEET FROM ORDINARY HIGH WATER AND SENSITIVE WATERS, INCLUDING WETLANDS.
12. IMPLEMENT THE FOLLOWING BARS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND STORAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES.
13. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL.
14. ON-SITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 15 MPH.
15. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE.
16. IF A STORMWATER TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
17. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR.
18. AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPs MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS.
19. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND DURING WET WEATHER.
20. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL.
21. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A REOCCURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME.
22. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS, DRAINAGE WAYS, OR WETLANDS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS.
23. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE.
24. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE.
25. PROVIDE PERMANENT EROSION CONTROL MEASURES ON ALL EXPOSED AREAS AS THEY ARE COMPLETED. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. HOWEVER, DO REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AS EXPOSED AREAS BECOME STABILIZED, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. PROPERLY DISPOSE OF CONSTRUCTION MATERIALS AND WASTE, INCLUDING SEDIMENT RETAINED BY TEMPORARY BMPs.



NOTE: CONTRACTOR MAY USE ALTERNATE DAM DETAIL, SUBJECT TO APPROVAL OF THE ENGINEER AND THE PERMITTING AGENCIES.

### DIVERSION DAM PROFILE

SCALE: 1" = 5'

2'

0 1 2 3 4 5 6 7 8 9 10'

DESIGNED BY: J.H.  
 DRAWN BY: D.H.  
 CHECKED BY: J.H.  
 DATE: 5/2/19  
 JOB NO.: 18-059

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

0 1 2 3 4 5 6 7 8 9 10'

C9 OF 9

**DELANO FARMS CULVERT REPLACEMENT - 100% DESIGN SUBMITTAL**

**NOTES AND DETAIL**

PREPARED AT THE REQUEST OF:  
**CLACKAMAS SWCD**

JAKE D. HOEFD  
 REGISTERED PROFESSIONAL ENGINEER  
 77870PE  
 OREGON  
 JANUARY 3, 2011  
 JAKE DYLAN WHEEL  
 EXPIRES: 6/30/2019

5/2/19 DATE

**WATERWAYS CONSULTING INC.**

1020 SW TAYLOR STREET, STE. 380  
 PORTLAND, OR 97205  
 PH: (503) 227-5979 / FAX: (888) 819-6847  
 WWW.WATWAYS.COM