



Erosion Control / Grading Details

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GRADING NOTES:

1. ALL GRADING SHALL CONFORM TO THE CITY OF CAMAS DESIGN STANDARDS MANUAL AND THE MOST RECENTLY ADOPTED EDITION OF THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION.
2. THE LIMITS OF CLEARING SHALL BE FLAGGED WITH HIGH-VISIBILITY FENCING PRIOR TO CLEARING AND GRUBBING OF THE SITE.
3. ANY EXISTING TREES TO REMAIN WITHIN THE CLEARING LIMITS SHALL BE MARKED AND PROTECTED FROM DAMAGE WITH HIGH VISIBILITY FENCING.
4. PRIOR TO ANY FILL PLACEMENT, ALL AREAS WHICH WILL RECEIVE STRUCTURAL FILL SHALL BE EXCAVATED TO FIRM, NON-ORGANIC, UNDISTURBED NATIVE GROUND. THE STRIPPED AREAS SHALL BE OBSERVED AND ACCEPTED BY THE GEOTECHNICAL ENGINEER AND THE CITY OF CAMAS INSPECTOR.
5. ALL LOT FILLS SHALL MEET 95% OF AASHTO T-99 COMPACTION.
6. ALL RIGHT-OF-WAY FILLS SHALL MEET 95% OF AASHTO T-180 COMPACTION.
7. FILLS SHALL BE INSTALLED IN VERTICAL LIFTS NOT EXCEEDING 8 INCHES IN THICKNESS AND SHALL BE COMPACTED AS PREVIOUSLY NOTED.
8. FILLS PLACED ON SLOPES EXCEEDING 5H:1V SHALL BE KEYED AND BENCHED, GEOTECHNICAL APPROVAL REQUIRED PRIOR TO ANY FILL PLACEMENT.
9. ALL SURFACES SHALL BE GRADED SMOOTH AND BE FREE OF IRREGULARITIES THAT MIGHT ACCUMULATE SURFACE WATER.
10. ALL CUT AND FILL SLOPES SHALL NOT EXCEED 2:1 SLOPES.
11. ANY EXCESS MATERIAL NOT REQUIRED TO MEET THE GRADES SHOWN ON THE PLANS SHALL BE HAULED FROM THE SITE TO A CONTRACTOR PROVIDED WASTE SITE. IF WASTE SITE IS WITHIN CITY LIMITS, A SEPARATE GRADING PERMIT MAY BE REQUIRED.
12. ALL EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY SUITABLE APPLICATION OF EROSION CONTROL BMP'S.
13. ALL SURFACES REQUIRING VEGETATION SHALL BE ROUGHENED PRIOR TO SEEDING (I.E. WHEEL TRACKED PERPENDICULAR TO SURFACE FLOW TO REDUCE EROSION AND HELP VEGETATION).
14. FINAL GEOTECHNICAL SUMMARY REPORT, INCLUDING ALL COMPACTION TESTING RESULTS, SHALL BE SUBMITTED UPON COMPLETION OF SITE GRADING WORK.



EROSION CONTROL DETAIL
GRADING NOTES

Jim P. Caruth 8-12-22
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

EC1

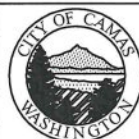
REVISION: 3

DATE: 8/12/2022

EROSION/SEDIEMENT CONTROL NOTES:

1. THE EROSION/SEDIMENT CONTROL (ESC) PLAN AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS TO BE UTILIZED AS A GUIDE TO CONTROL THE TRANSPORT OF LOOSE SOILS TO THE PROPERTY OUTSIDE OF THE CONSTRUCTION AREA AND AROUND THE CONSTRUCTION SITE. THE ESC MEASURES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.
2. THE IMPLEMENTATION OF THE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THE ESC MEASURES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND PERMANENT VEGETATION/LANDSCAPING IS ESTABLISHED.
3. IF THE CITY INSPECTOR OR ENGINEER(S) HAS EVIDENCE OF POOR CONSTRUCTION PRACTICES OR EROSION CONTROL TECHNIQUES, A "STOP WORK" ORDER SHALL BE ISSUED UNTIL PROPER MEASURES HAVE BEEN TAKEN AND APPROVED BY THE CITY ENGINEERING STAFF.
4. THE CONTRACTORS SHALL BE RESPONSIBLE TO FAMILIARIZE THEMSELVES WITH THE MOST RECENTLY ADOPTED EDITION OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOL. II AND THE CITY OF CAMAS MUNICIPAL CODE 14.06 (2011).
5. ALL EROSION/SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND IN WORKING CONDITION PRIOR TO DISTURBING AND EXPOSING ANY SOIL SURFACES (I.E. CONSTRUCTION ENTRANCES, FILTER FABRIC SEDIMENT BARRIERS, AND SEDIMENTATION TRAPS) AND MAINTAINED FOR THE DURATION OF THE PROJECT. TRAPPED SEDIMENT IN EXCESS OF 1 FOOT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED SOIL AREAS RESULTING FROM VEGETATION REMOVAL SHALL BE PERMANENTLY STABILIZED. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
6. TO MINIMIZE EROSION AND SEDIMENTATION TRANSPORTATION, EARTHWORK SHALL NOT BE PERFORMED WHILE SOILS ARE IN AN UNSTABLE STATE DUE TO PRECIPITATION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE TO HAVE CLEARING LIMITS AND/OR ANY EASEMENTS, SENSITIVE OR CRITICAL AREAS, AND THEIR BUFFERS, TREES, AND DRAINAGE COURSES FLAGGED PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. FLAGGING LIMITS ARE TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
8. REMOVE ONLY THOSE TREES AND SHRUBS THAT NEED TO BE REMOVED FOR THE CONSTRUCTION OF ROADS, SIDEWALKS, UTILITIES, AND STORMWATER FACILITIES.
9. ALL EXISTING AND NEWLY CONSTRUCTED ROAD CATCH BASINS AND CURB INLETS AFFECTED BY CONSTRUCTION SHALL BE PROTECTED AGAINST SEDIMENT DEPOSITS. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
10. ALL POLLUTANTS THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER SYSTEM.
11. ALL DISTURBED SOIL SURFACES ARE TO BE STABILIZED BY A SUITABLE APPLICATION OF "BEST MANAGEMENT PRACTICES" (BMP'S). DURING THE PERIOD OF OCTOBER 1 THROUGH JULY 5 DISTURBED SOILS MAY REMAIN UNSTABILIZED FOR UP TO TWO DAYS WHEN NOT BEING WORKED. FROM JULY 5 THROUGH OCTOBER 1, DISTURBED SOILS MAY REMAIN UNSTABILIZED FOR UP TO 7 DAYS WHEN NOT BEING WORKED. STABILIZATION OF DISTURBED SOIL AREAS MAY CONSIST OF HYDROSEEDING, HAND-SEEDING AND MULCHING, PLACEMENT OF EROSION CONTROL BLANKETS OR PLASTIC. ALL SEEDED AREAS ARE TO BE FERTILIZED, WATERED, AND MAINTAINED TO ENSURE THAT THE GROWTH OF VEGETATION OCCURS AS SOON AS POSSIBLE.
12. ALL TEMPORARY SEDIMENT AND EROSION CONTROL BMP'S SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMP'S ARE NO LONGER NEEDED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SD	JC
2	1/1/11	SCD	JC



CITY OF CAMAS ~ EROSION CONTROL DETAIL
 EROSION/SEDIMENT CONTROL NOTES

Donald P. Cuthbert 1-4-11
 DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.
 EC2

EC-NOTES.DWG

EROSION/SEDIMENT CONTROL NOTES (CONTINUED):

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR POLICING THE JOB SITE DAILY AND MAINTAINING THE EROSION/SEDIMENT CONTROL MEASURES THROUGHOUT ALL PHASES OF CONSTRUCTION. AN INSPECTION LOG SHALL BE KEPT AND MADE AVAILABLE TO THE CITY OF CAMAS. THE POLICING AND MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO:
 - VERIFYING THAT ALL AREAS ARE GRADED SUCH THAT ALL RUNOFF IS DIRECTED TO A SEDIMENTATION DEVICE BEFORE DISCHARGE TO SURFACE.
 - REMOVAL OF TRAPPED SILT AT SILT BARRIERS, SILT TRAPS, OR POINTS OF ACCUMULATION.
 - ADDITIONAL PROTECTIVE MEASURES DUE TO JOB SITE OR WEATHER CONDITIONS AS REQUIRED BY THE CITY OF CAMAS.
 - MONITORING OF VEHICLES LEAVING THE SITE TO MINIMIZE TRANSMISSION OF LOOSE SOILS TO THE PUBLIC ROADWAYS.
 - VERIFY THAT ALL PROPERTIES ADJACENT TO THE PROJECT SITE ARE PROTECTED FROM SEDIMENTATION DEPOSITION. THIS MAY BE ACCOMPLISHED BY INSTALLING PERIMETER CONTROLS SUCH AS SEDIMENTATION BARRIERS, FILTERS OR DIKES, SEDIMENTATION BASINS/TRAPS, OR BY A COMBINATION OF SUCH MEASURES.
14. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES SHALL BE STABILIZED IN ACCORDANCE WITH EROSION/SEDIMENT CONTROL NOTE 11. SLOPES FOUND TO BE ERODING EXCESSIVELY WITHIN TWO YEARS OF CONSTRUCTION MUST BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES. THESE MEASURES MAY CONSIST OF ROUGHENED SOIL SURFACES, INTERCEPTORS, DIVERSIONS OR TERRACES, TEMPORARY OR PERMANENT CHANNELS, ADDITIONAL VEGETATION, OR PIPE SLOPE DRAINS AS REQUIRED BY THE CITY OF CAMAS UNTIL THE PROBLEM IS CORRECTED.
15. THE ESC MEASURES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 24 HOURS FOLLOWING ANY STORM EVENT.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING UNDERGROUND UTILITIES AS SPECIFIED BELOW:
 - WHERE FEASIBLE, NO MORE THAN 500 FEET OF TRENCH SHALL BE OPEN AT ONE TIME.
 - WHERE CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS, EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
 - TRENCH DE-WATER DEVICES SHALL DISCHARGE INTO A SEDIMENT TRAP OR SEDIMENT POND.
17. PRIOR TO CONSTRUCTION, THE CITY OF CAMAS REQUIRES AN APPROVED FORM OF SECURITY IN THE AMOUNT OF 200% OF THE ENGINEER'S ESTIMATED COST OF THE ESC MEASURES, INCLUDING ASSOCIATED LABOR, AS SHOWN IN THE APPROVED ESC PLAN AND SWPPP.

18. SUGGESTED STANDARD SEED MIXTURE FOR THOSE AREAS WHERE A TEMPORARY VEGETATIVE COVER IS REQUIRED:

TEMPORARY EROSION CONTROL MIX*

SEED VARIETY	% WEIGHT	% PURITY	% GERMINATION
CHEWINGS OR ANNUAL BLUE GRASS (FESTUCA RUBRA VAR. COMMUTATA OR POA ANNA)	40	98	90
PERENNIAL RYE (LOLIUM PERENNE)	50	98	90
REDTOP OR COLONIAL BENTGRASS (AGROSTIS ALBA OR AGROSTIS TENUIS)	5	92	85
WHITE DUTCH CLOVER (TRIFOLIUM REPENS)	5	98	90

*APPLICATION RATE OF 120 LBS/ACRE AND COVERED WITH STRAW OR MULCH

19. SUGGESTED TURF SEED MIXTURE FOR DRY SITUATIONS WHERE THERE IS NO NEED FOR MUCH WATER:

LOW-GROWING TURF SEED MIX*

SEED VARIETY	% WEIGHT	% PURITY	% GERMINATION
DWARF TALL FESCUE (SEVERAL VARIETIES) (FESTUCA ARUNDINACEA VAR.)	45	98	90
DWARF PERENNIAL RYE (LOLIUM PERENNE VAR. BARCLAY)	30	98	90
RED FESCUE (FESTUCA RUBRA)	20	98	90
COLONIAL BENTGRASS (AGROSTIS TENUIS)	5	98	90

*APPLICATION RATE OF 120 LBS/ACRE AND COVERED WITH STRAW OR MULCH

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1	9/18/07	SD	JC
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CITY OF CAMAS ~ EROSION CONTROL DETAIL
EROSION/SEDIMENT CONTROL NOTES

Sam P. Caruthers 1-4-11
DETAIL APPROVED BY DATE

DETAIL NO.
EC3

NOT TO SCALE

EC-NOTES.DWG

WATER QUALITY NOTES:

1. GRADE BIOFILTRATION SWALE CAREFULLY TO ATTAIN UNIFORM LONGITUDINAL AND LATERAL SLOPES IN ORDER TO ELIMINATE HIGH AND LOW SPOTS.
2. VEGETATION IN BIOFILTRATION SYSTEMS SHALL BECOME FULLY ESTABLISHED PRIOR TO INSTALLATION OF AC PAVEMENT FOR ALL AREAS DRAINING INTO THE WATER QUALITY SYSTEM. IF SOD IS PLACED IN BIOFILTRATION SYSTEM PRIOR TO PAVING, THE CONTRACTOR SHALL OVERSEED THE SOD WITH THE SPECIFIED SEED MIX PRIOR TO COMPLETION OF THE PROJECT.
3. BIOFILTRATION SYSTEMS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL FINAL ACCEPTANCE OF THE PROJECT BY THE CITY. THIS SHALL INCLUDE IRRIGATING, MOWING, AND ALL OTHER MAINTENANCE AS REQUIRED TO MAINTAIN A HEALTHY STAND OF GRASS.
4. SUGGESTED STANDARD SEED MIXTURE FOR BIOFILTRATION SWALE APPLICATIONS:

BIOSWALE SEED MIX*

SEED VARIETY	% WEIGHT	% PURITY	% GERMINATION
TALL OR MEADOW FESCUE <i>(FESTUCA ARUNDINACEA OR FESTUCA ELATIOR)</i>	75-80	98	90
SEASIDE/CREEPING BENTGRASS <i>(AGROSTIS PALUSTRIS)</i>	10-15	92	85
REDTOP BENTGRASS <i>(AGROSTIS ALBA OR AGROSTIS GIGANTEA)</i>	5-10	90	80

*APPLICATION RATE OF 120 LBS/ACRE AND COVERED WITH STRAW OR MULCH

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CITY OF CAMAS ~ EROSION CONTROL DETAIL
WATER QUALITY NOTES

Sam P. Cristofani 1-4-11
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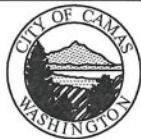
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EC4

SITE SITUATION	EROSION CONTROL MATRIX		Gravel construction entrance	Sediment fence or barrier at toe of disturbed area	Sediment fence at slope break >= 20%	Sediment fence or barrier spacing; install on contour	Seed & mulch 1000 lb/ac with bonding agent	Seed & mulch 2000 lb/ac with heavy bonding agent or netting & anchors	Erosion blankets with anchors	6 mil plastic sheet cover with anchors	Sediment trap drain area <3 acre	Sediment pond drain; area <10 acre	Groove or stair-step slope; seed & mulch 1 ton/acre	Re-establish vegetation or landscape prior to removal of erosion control measures	Sediment barrier around catch basins	Sediment barrier or other approved measure in ditch/swale
	EROSION MEASURES															
SINGLE FAMILY/DUPLEX RES. 50% + of site, slope <20% 50% + of site, slope >20%	X	X	X	X			O	O		O	NA	NA	O	X		
<5000 sq. ft. DISTURBED AREA	X	X	X	X	X		O	X	O	O	NA	NA		X		
OTHER DISTURBED SITES	X	X	X	X			X	X	O	O	O	O		X		
slope < 6%	X	X	X	X		x700'	NA	X	O	O	O	O		X		
< 8%	X	X	X	X		x450'	NA	X	O	O	O	O		X		
<10%	X	X	X	X		x300'	NA	X	O	O	O	O		X		
<12%	X	X	X	X		x200'	NA	X	O	O	O	O		X		
<15%	X	X	X	X		x150'	NA	X	O	O	O	O		X		
<20%	X	X	X	X		x100'	NA	X	O	O	O	O		X		
<30%	X	X	X	X	X	x 50'	NA	X	O	O	O	O		X		
<40%	X	X	X	X	X	x 25'	NA	X	O	O	O	O	O	X		
>=40%	X	X	X	X	X	x 25'	NA	X	O	NA	NA	NA	O	X		
OTHER spoils stock piles utilities construction catch basin drainage direct ditch drainage ditches/swales				X						X					X	X

KEY: X - Base Measures Year-around Construction O - Option/Alternate to X NA - Not Allowed

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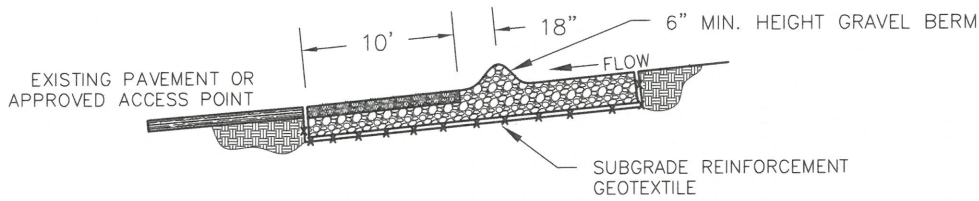


CITY OF CAMAS ~ EROSION CONTROL DETAIL
EROSION CONTROL MATRIX

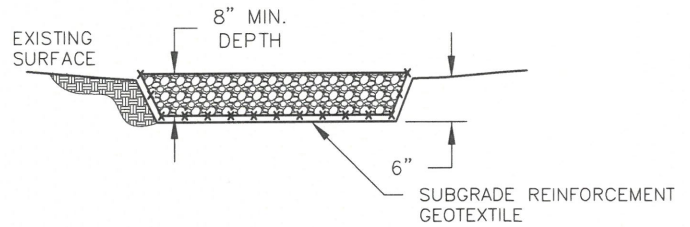
James P. Crothers 1-4-11
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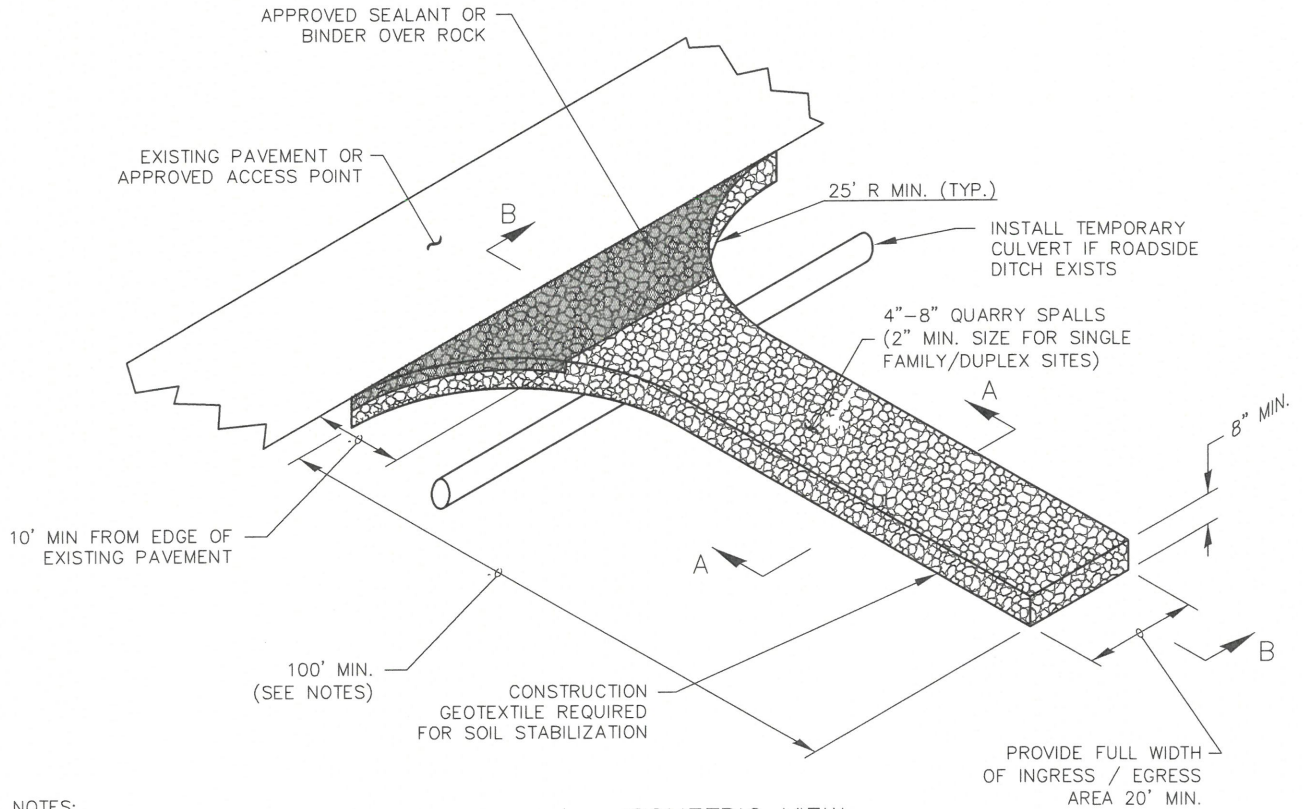
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EC5



SECTION B-B



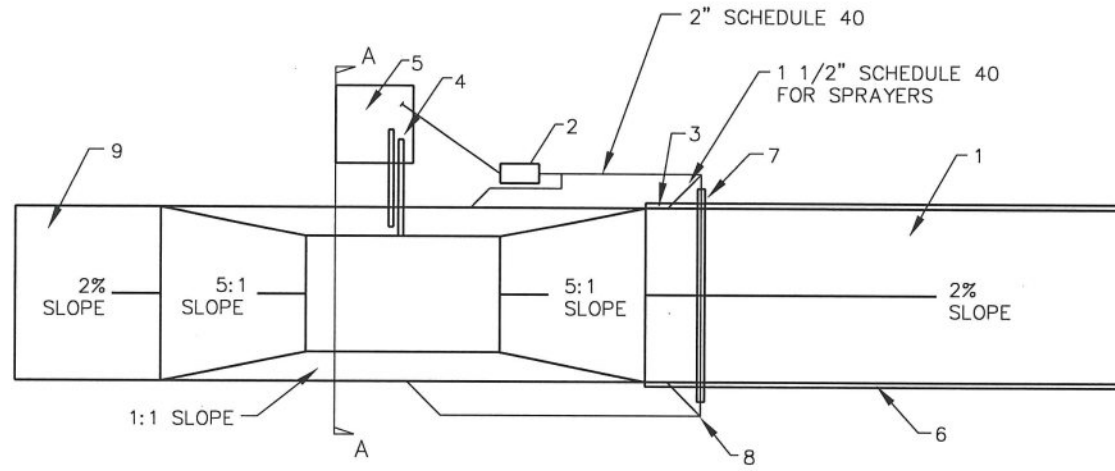
SECTION A-A



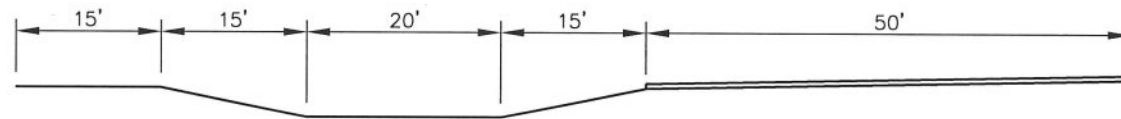
ISOMETRIC VIEW

NOTES:

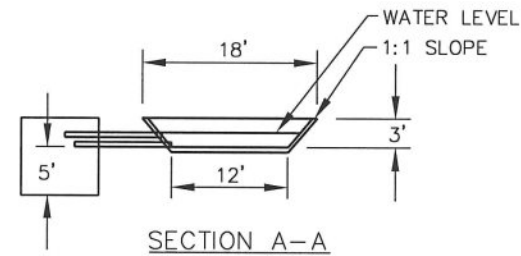
1. 100 FOOT MINIMUM MAY BE REDUCED FOR SITES WITH LESS THAN ONE ACRE OF EXPOSED SOIL, IF APPROVED BY SITE INSPECTOR.
2. LENGTH OF ENTRANCE MAY BE INCREASED BASED ON SITE ACREAGE & AMOUNT OF DISTURBED SOIL.
3. ROCK SHALL BE REMOVED AND REPLACED, OR ADDITIONAL ROCK ADDED IF ENTRANCE FAILS TO FUNCTION AS INTENDED.



WHEEL WASH PLAN



ELEVATION VIEW

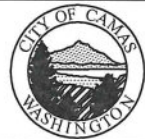


SECTION A-A

NOTES:

1. ASPHALT CONSTRUCTION ENTRANCE 6 IN. ASPHALT TREATED BASE (ATB).
2. 3 IN. TRASH PUMP WITH FLOATS ON THE SUCTION HOSE.
3. MIDPOINT SPRAY NOZZLES, IF NEEDED.
4. 6 IN. SEWER PIPE WITH BUTTERFLY VALVES. BOTTOM ONE IS A DRAIN. LOCATE TOP PIPE'S INVERT 1-FT. ABOVE BOTTOM OF WHEEL WASH.
5. 8 FT. X 8 FT. SUMP WITH 5-FT. OF CATCHMENT BUILD SO IT CAN BE CLEANED WITH TRACKHOE.
6. 6 IN. ASPHALT CURB ON THE LOW ROAD SIDE TO DIRECT WATER BACK TO POND.
7. 6 IN. SLEEVE UNDER ROAD.
8. BALL VALVES.
9. 15 FT. ATB APRON TO PROTECT GROUND FROM SPLASHING WATER.
10. SEDIMENT LADEN WATER SHALL BE PUMPED INTO A BAKER TANK AND REMOVED.

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CITY OF CAMAS ~ EROSION CONTROL DETAIL
WHEEL WASH

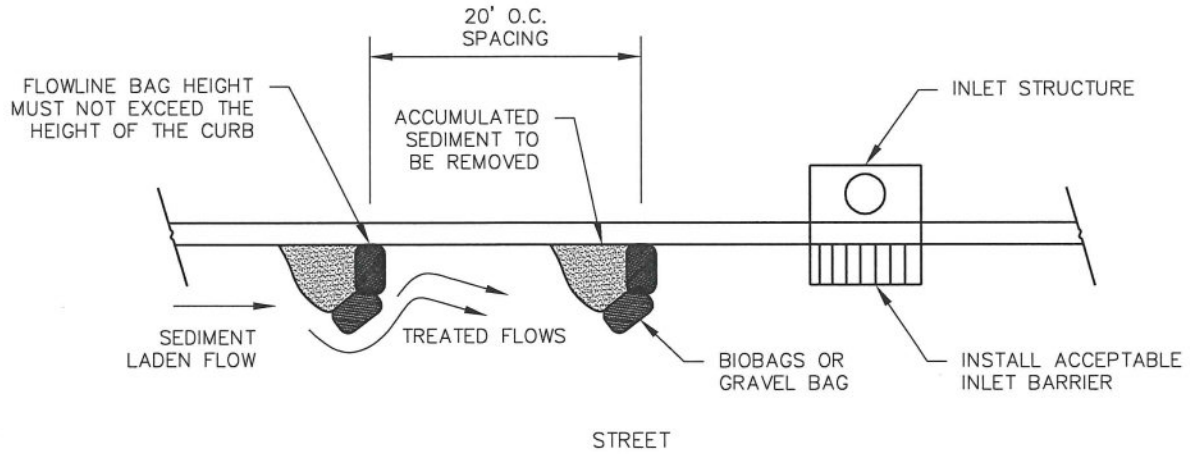
Jan C. Caution 1-4-11
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

EC7

APPROXIMATE SPACING BETWEEN BARRIERS



BIOBAGS OR GRAVEL BAG FILTERS

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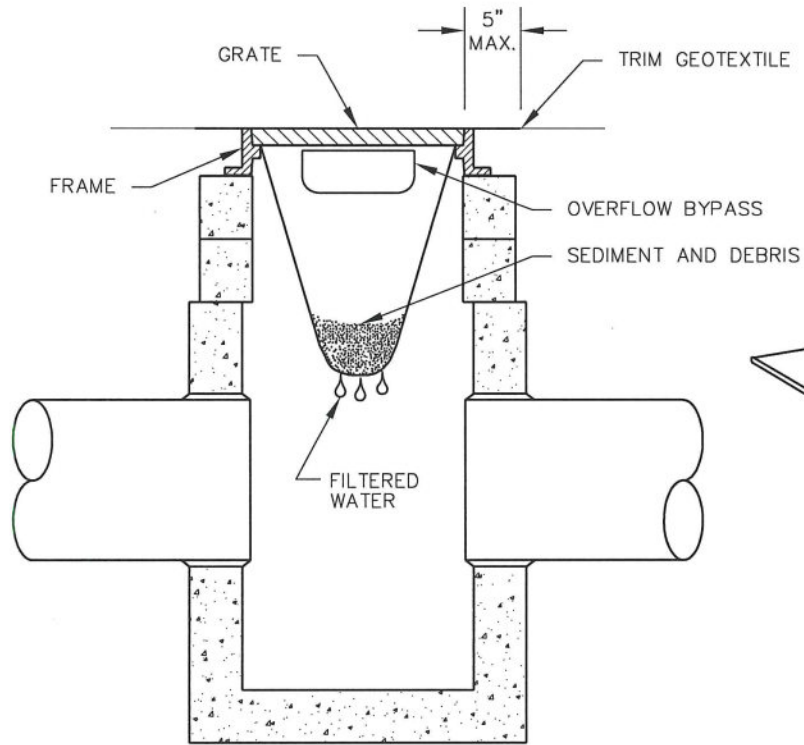
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 INLET PROTECTION - CURB SEDIMENT TRAPS

Sam C. Crothers 1-4-11
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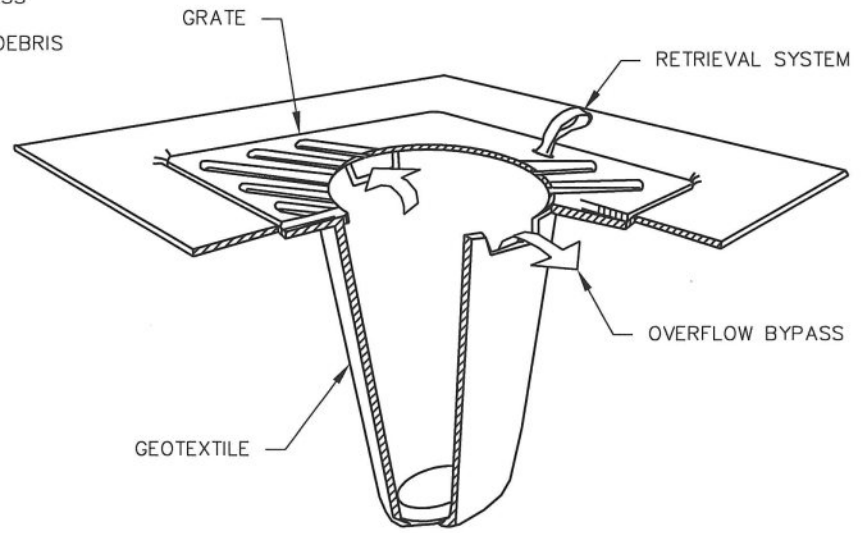
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DETAIL NO.

EC8



CROSS SECTION



ISOMETRIC VIEW

NOTES:

1. INSERTS TO BE REMOVED AND CLEANED OR REPLACED ONCE A MONTH DURING RAINY SEASON.
2. SIZE THE BELOW GRATE INLET DEVICE (BGID) FOR THE STORM WATER STRUCTURE IT WILL SERVICE.
3. THE BGID SHALL HAVE A BUILT-IN HIGH-FLOW RELIEF SYSTEM (OVERFLOW BYPASS).
4. THE RETRIEVAL SYSTEM MUST ALLOW REMOVAL OF THE BGID WITHOUT SPILLING THE COLLECTED MATERIAL.

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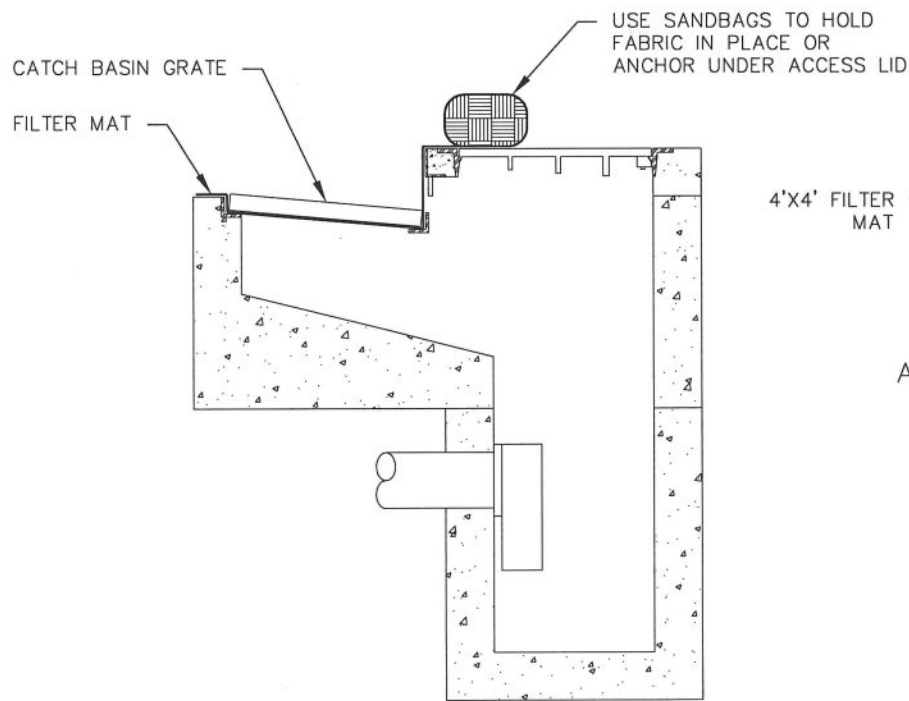
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 INLET PROTECTION – CATCH BASIN INSERT

Don P. Cothran 1-4-11
 DETAIL APPROVED BY DATE

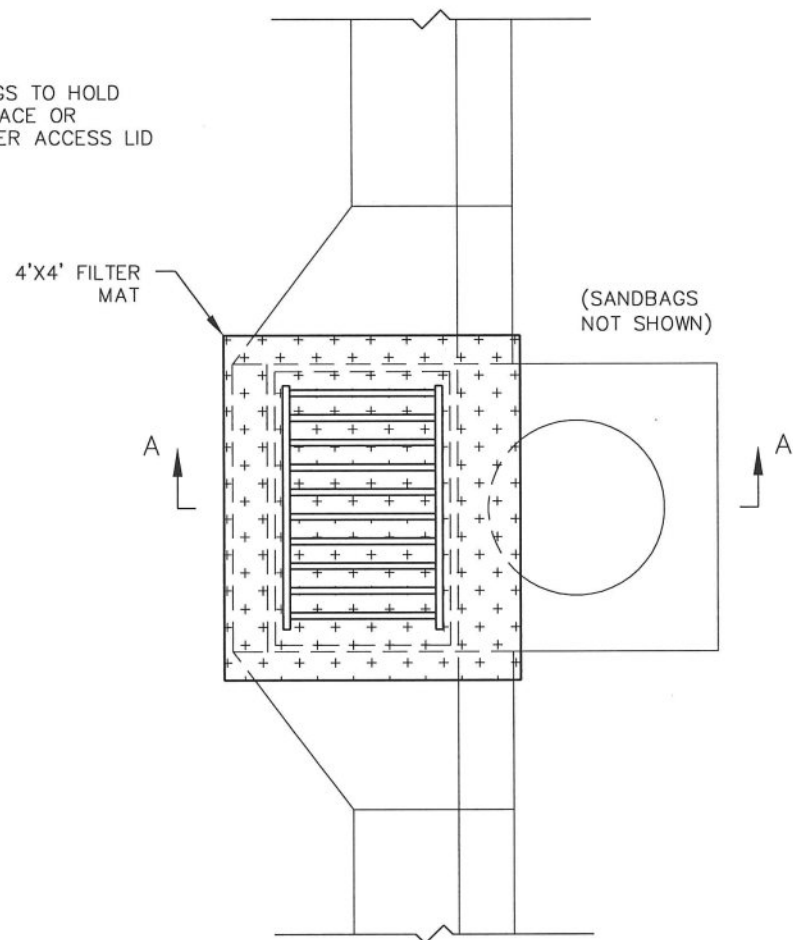
DETAIL NO.

EC9

NOT TO SCALE



SECTION A-A



NOTES:

1. USE FILTER MAT SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING STREET, WITH MINIMAL NEED, WHERE WATER CAN FILTER AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

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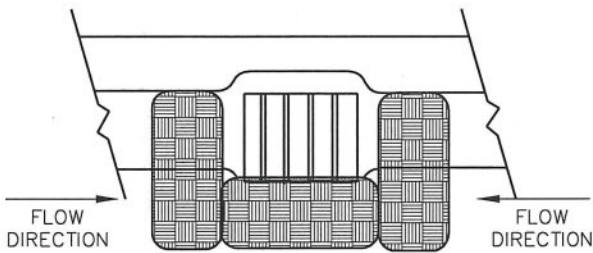
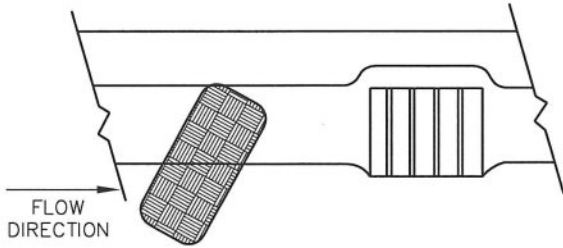
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 INLET PROTECTION - COMBINATION INLET

Sam P. Cothran 1-4-11
 DETAIL APPROVED BY DATE

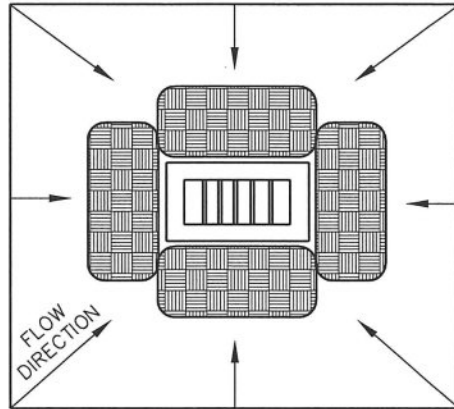
NOT TO SCALE

DETAIL NO.

EC10



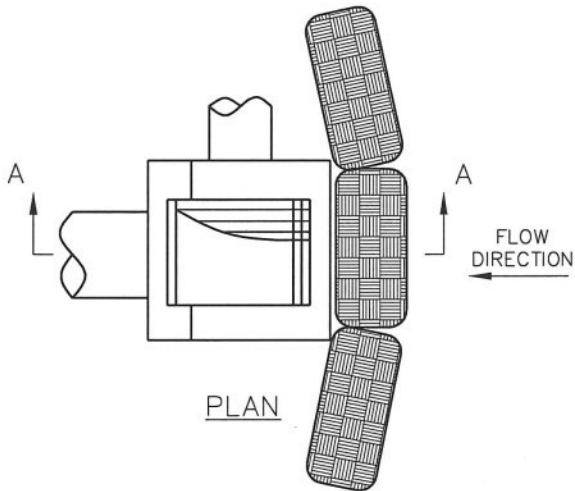
CATCH BASIN



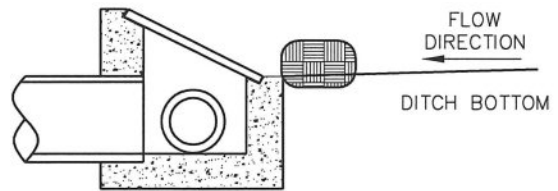
AREA DRAIN

NOTES:

1. MAY BE USED SHORT TERM WITH UTILITY WORK AND WITH PHASING OF DEVELOPMENT (E.G. HOME BUILDERS).
2. REPLACE WITH NEW BAGS AS EXISTING BAGS BECOME SILT LADEN.



PLAN



SECTION A-A

DITCH INLET

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

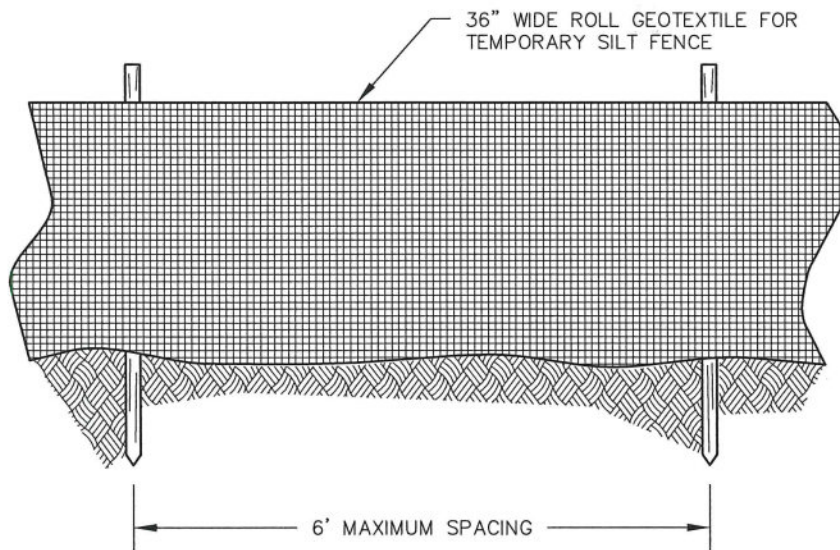


CITY OF CAMAS ~ EROSION CONTROL DETAIL
INLET PROTECTION - BIOBAGS

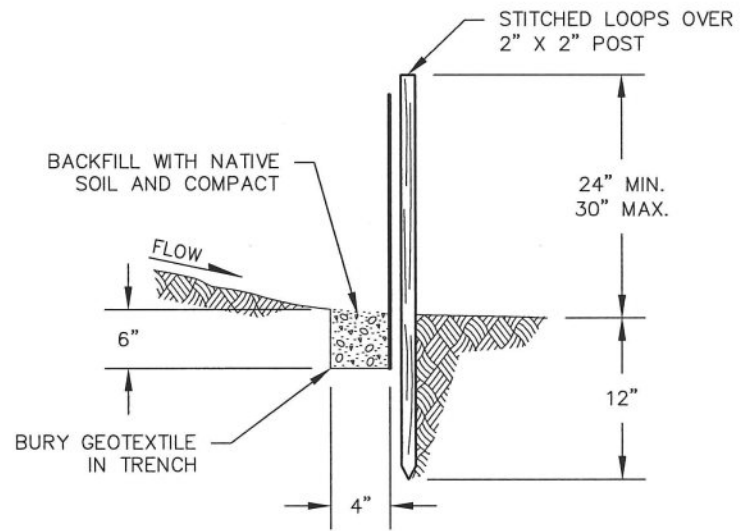
Jim P. ... 1-4-11
DETAIL APPROVED BY DATE

NOT TO SCALE

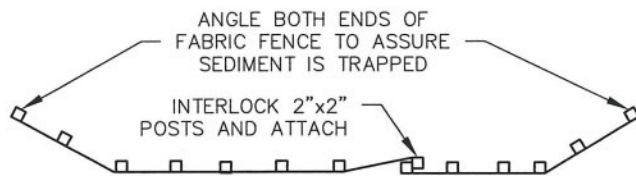
DETAIL NO.
EC11



ELEVATION VIEW



SIDE VIEW

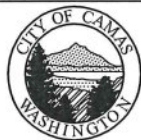


TOP VIEW

NOTES:

1. MAXIMIZE DETENTION OF STORMWATER BY PLACING FENCE AS FAR AWAY FROM THE TOE OF SLOPE AS POSSIBLE WITHOUT ENCROACHING ON SENSITIVE AREAS OR OUTSIDE OF THE CLEARING BOUNDARIES.
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
3. COMPACT ALL AREAS OF FABRIC TRENCH.
4. POSTS SHALL BE WOOD, DIMENSIONAL FIR OR PINE, 2"x2" NOMINAL.
5. STITCHED LOOPS SHALL BE INSTALLED ON UPHILL SIDE OF FENCE.
6. INSTALL SEDIMENT FENCING ALONG CONTOURS WHENEVER POSSIBLE.
7. INSTALL THE ENDS OF THE SEDIMENT FENCE TO POINT SLIGHTLY UP-SLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
8. SEDIMENT BUILDUP IN EXCESS OF 8-INCHES SHALL BE REMOVED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC
3	3/1/12	SCD	JC



CITY OF CAMAS ~ EROSION CONTROL DETAIL
SILT FENCE

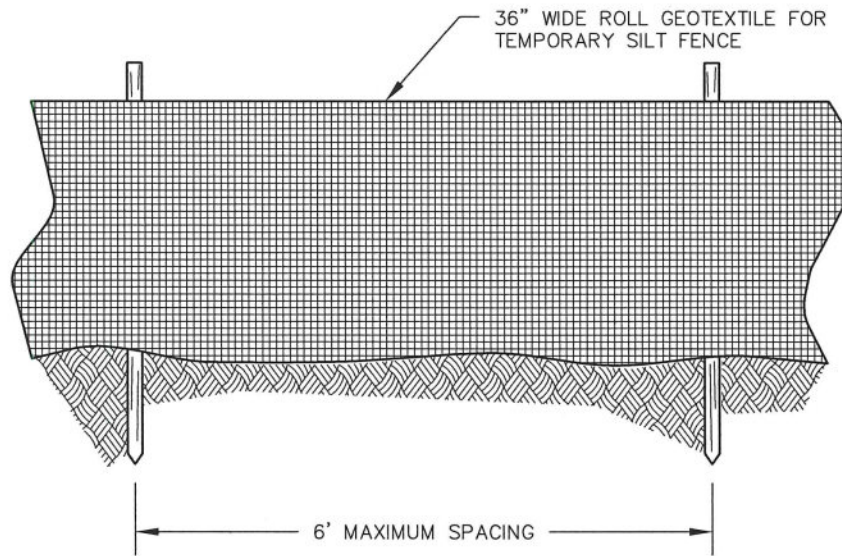
DETAIL APPROVED BY *James P. Cauffman* 3-1-12
DATE

DETAIL NO.

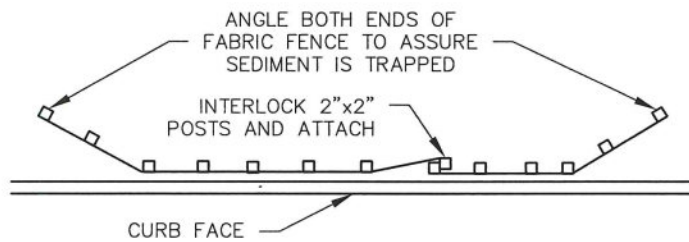
EC12

NOT TO SCALE

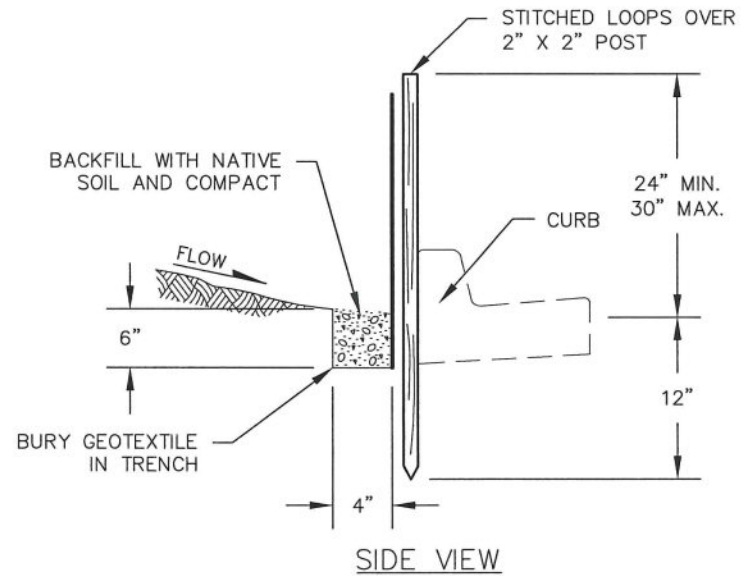
EC-SEDFENCE.DWG



ELEVATION VIEW



TOP VIEW



SIDE VIEW

NOTES:

1. MAXIMIZE DETENTION OF STORMWATER BY PLACING FENCE AS FAR AWAY FROM THE TOE OF SLOPE AS POSSIBLE WITHOUT ENCROACHING ON SENSITIVE AREAS OR OUTSIDE OF THE CLEARING BOUNDARIES.
2. INSTALL FENCE BEHIND CURB FOR LOTS THAT SLOPE DOWN TO CURB LINE.
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
3. COMPACT ALL AREAS OF FABRIC TRENCH.
4. POSTS SHALL BE WOOD, DIMENSIONAL FIR OR PINE, 2"x2" NOMINAL.
5. STITCHED LOOPS SHALL BE INSTALLED ON UPHILL SIDE OF FENCE.
6. INSTALL SEDIMENT FENCING ALONG CONTOURS WHENEVER POSSIBLE.
7. INSTALL THE ENDS OF THE SEDIMENT FENCE TO POINT SLIGHTLY UP-SLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
8. SEDIMENT BUILDUP IN EXCESS OF 8-INCHES SHALL BE REMOVED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC
3	3/1/12	SCD	JC



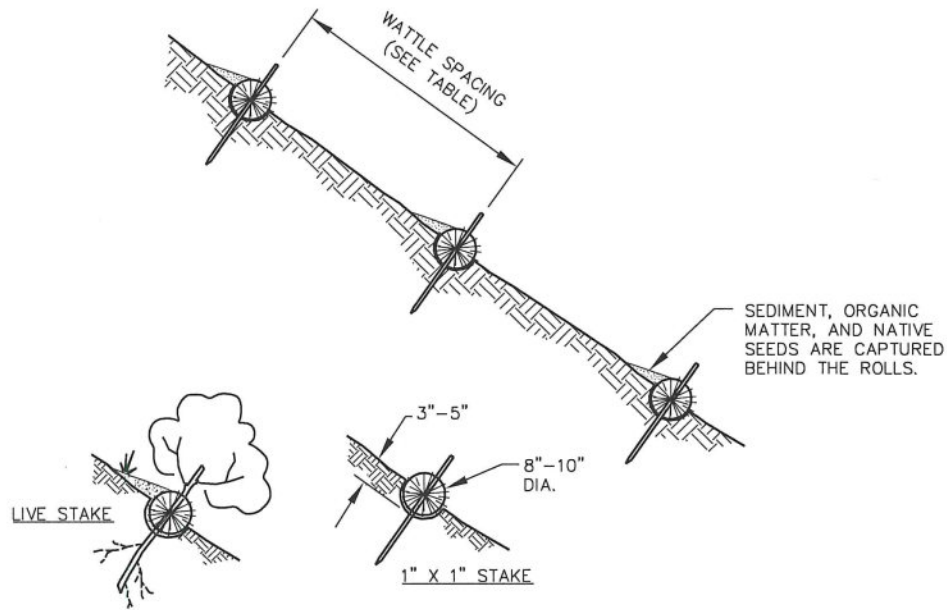
CITY OF CAMAS ~ EROSION CONTROL DETAIL
SILT FENCE FOR HOME BUILDERS

Don P. Coe 3-1-12
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

EC13

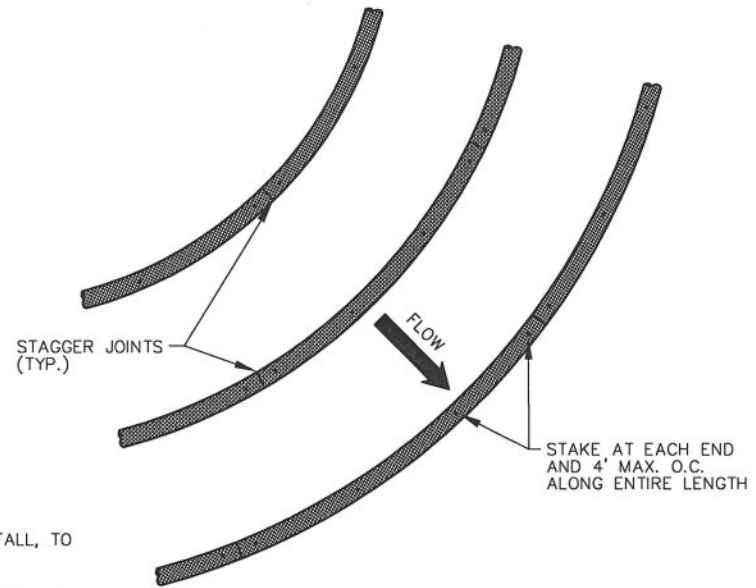
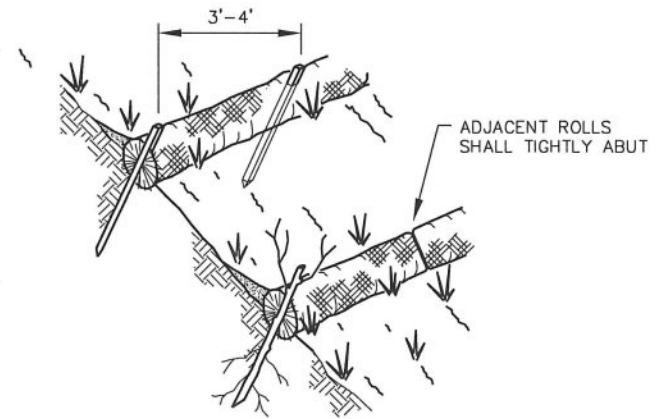


ELEVATION VIEW

WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1 - 1.5:1	3-4 FEET
1.5:1 - 2:1	4-5 FEET
2:1 - 2.5:1	5-6 FEET
2.5:1 - 4:1	6-8 FEET
3.5:1 - 4:1	8-12 FEET
4.5:1 - 5:1	10-20 FEET

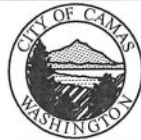
NOTES:

1. INSTALL WATTLES ALONG CONTOURS IN A 3"-5" DEEP TRENCH.
2. WATTLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. SPEC. 9-14.5(5).
3. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
4. LIVE STAKES MAY BE USED FOR PERMANENT INSTALLATIONS.
5. INSTALL WATTLES SNUGLY INTO THE TRENCH. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
6. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLE AND INTO THE SOIL, WHEN SOIL CONDITIONS REQUIRE.
7. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.



PLAN VIEW

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



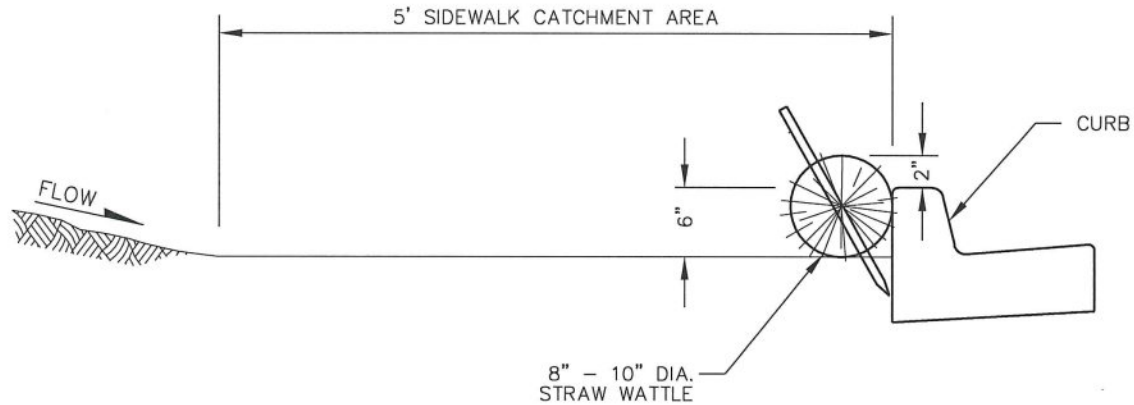
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 STRAW WATTLES ON SLOPE

Sam P. Crosthorn 1-4-11
 DETAIL APPROVED BY DATE

DETAIL NO.

EC14

NOT TO SCALE



NOTES:

1. INSTALL WATTLES BEHIND CURB IN 5' SIDEWALK CATCHMENT AREA OR PLANTER STRIP.
2. WATTLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. SPEC. 9-14.5(5).
3. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
4. SEDIMENT BUILDUP IN EXCESS OF 4-INCHES IS TO BE REMOVED.
5. INSTALL WATTLES SNUGLY AGAINST THE BACK OF CURB USING 1" x 1" FIR OR PINE STAKE. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
6. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLE AND INTO THE SOIL, WHEN SOIL CONDITIONS REQUIRE.

REV. NO.	DATE	BY	APPR.
1	1/1/11	SCD	JC



**CITY OF CAMAS ~ EROSION CONTROL DETAIL
STRAW WATTLES BEHIND CURB**

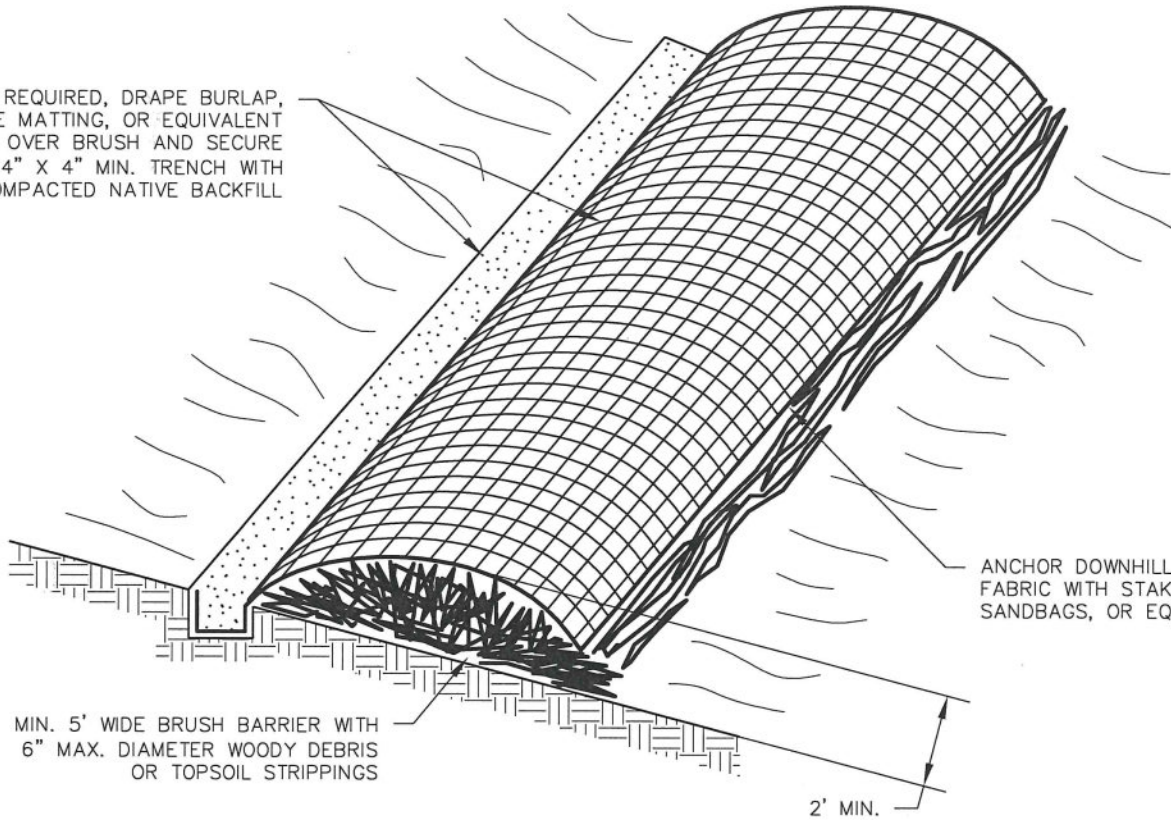
Jan P. Cothran 1-4-11
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

EC15

IF REQUIRED, DRAPE BURLAP, JUTE MATTING, OR EQUIVALENT FABRIC OVER BRUSH AND SECURE IN 4" X 4" MIN. TRENCH WITH COMPACTED NATIVE BACKFILL



ANCHOR DOWNHILL EDGE OF FABRIC WITH STAKES, SANDBAGS, OR EQUIVALENT

MIN. 5' WIDE BRUSH BARRIER WITH 6" MAX. DIAMETER WOODY DEBRIS OR TOPSOIL STRIPPINGS

2' MIN.

REV. NO.	DATE	BY	APPR.
1	1/1/11	SCD	JC

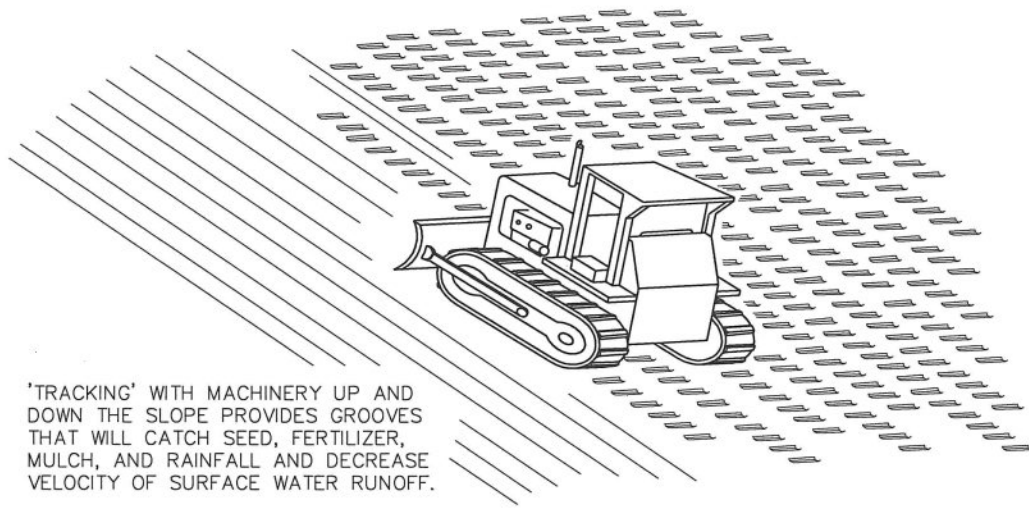


CITY OF CAMAS ~ EROSION CONTROL DETAIL
BRUSH BARRIER

Don P. Cothran 1-4-11
DETAIL APPROVED BY DATE

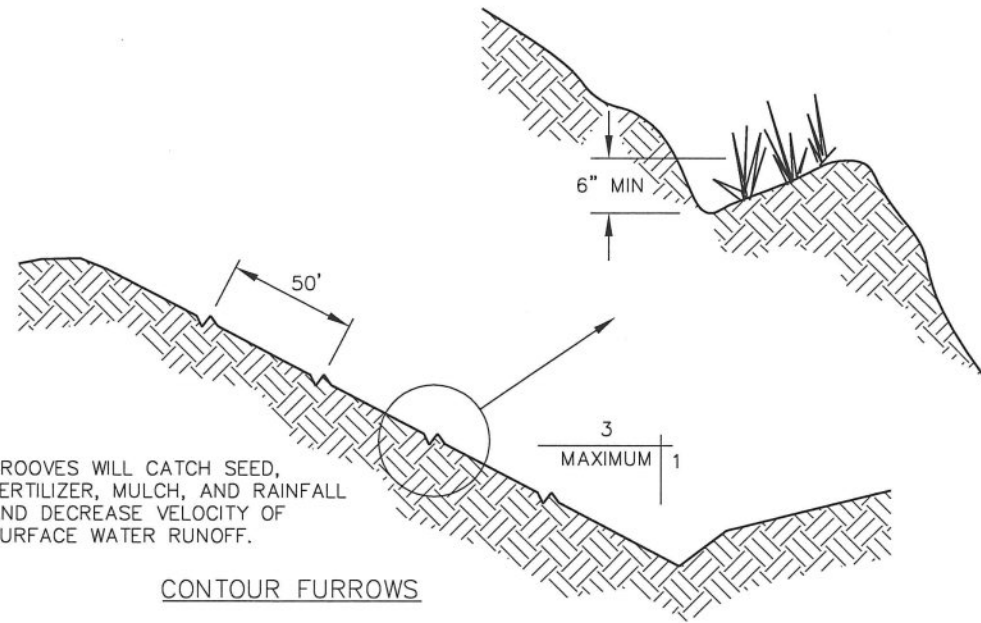
DETAIL NO.
EC16

NOT TO SCALE



'TRACKING' WITH MACHINERY UP AND DOWN THE SLOPE PROVIDES GROOVES THAT WILL CATCH SEED, FERTILIZER, MULCH, AND RAINFALL AND DECREASE VELOCITY OF SURFACE WATER RUNOFF.

TRACKING



GROOVES WILL CATCH SEED, FERTILIZER, MULCH, AND RAINFALL AND DECREASE VELOCITY OF SURFACE WATER RUNOFF.

CONTOUR FURROWS

NOTES:

- 1 TRACKING IS DONE BY OPERATING EQUIPMENT UP AND DOWN THE SLOPE TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL.
2. TRACKED SURFACES SHALL BE SEEDED IMMEDIATELY AFTER TRACKING.
3. SLOPES WHERE MOWING IS PLANNED SHOULD NOT BE EXCESSIVELY ROUGHENED.

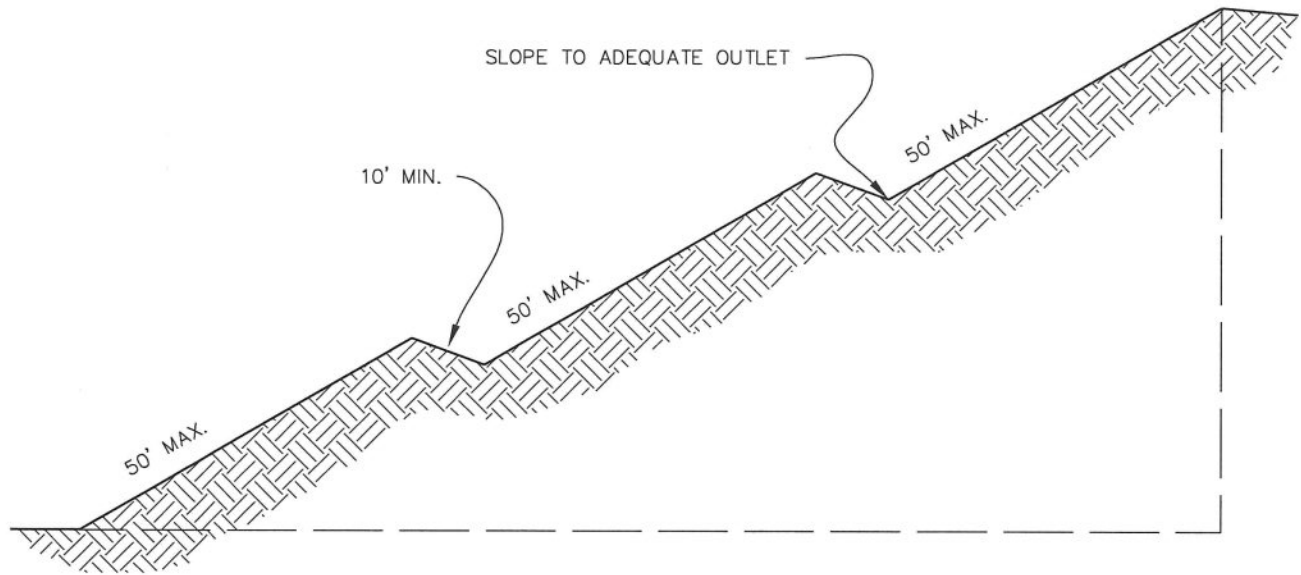
REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



CITY OF CAMAS ~ EROSION CONTROL DETAIL
 SURFACE ROUGHENING – TRACKING & FURROWS
Jan P. Coathran 1-4-11
 DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.
 EC17



NOTES:

1. ALL GRADIENT TERRACES SHOULD HAVE ADEQUATE OUTLETS. SUCH AN OUTLET MAY BE A GRASSED WATERWAY, VEGETATED AREA, OR TILE OUTLET. IN ALL CASES THE OUTLET MUST CONVEY RUNOFF FROM THE TERRACE OR TERRACE SYSTEM TO A POINT WHERE THE OUTFLOW WILL NOT CAUSE DAMAGE. VEGETATIVE COVER SHOULD BE USED IN THE OUTLET CHANNEL.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



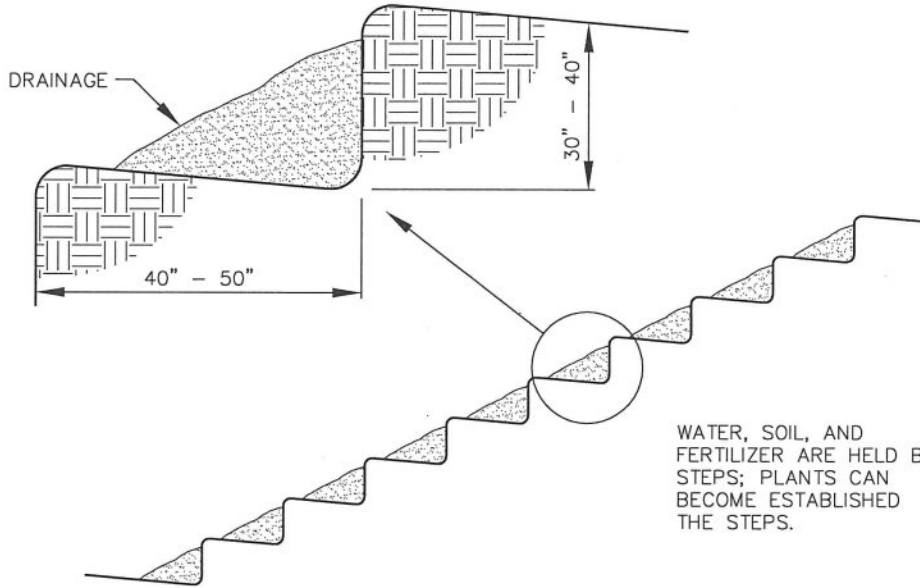
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 SURFACE ROUGHENING – GRADIENT TERRACES

Sam P. Cauffman 1-4-11
 DETAIL APPROVED BY DATE

NOT TO SCALE

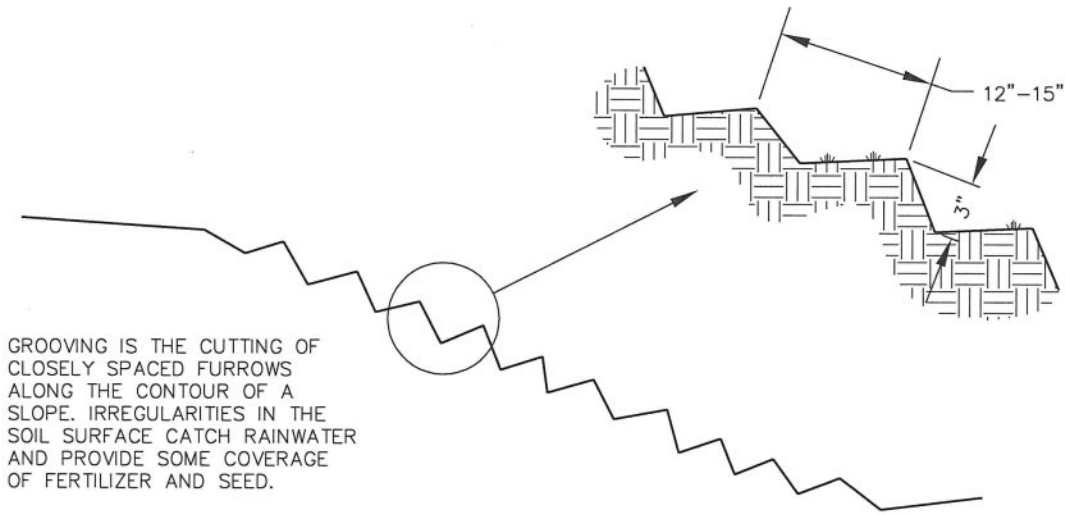
DETAIL NO.
 EC18

DEBRIS FROM SLOPE ABOVE
IS CAUGHT BY STEPS



WATER, SOIL, AND
FERTILIZER ARE HELD BY
STEPS; PLANTS CAN
BECOME ESTABLISHED ON
THE STEPS.

STAIR STEPPING CUT SLOPES



GROOVING IS THE CUTTING OF
CLOSELY SPACED FURROWS
ALONG THE CONTOUR OF A
SLOPE. IRREGULARITIES IN THE
SOIL SURFACE CATCH RAINWATER
AND PROVIDE SOME COVERAGE
OF FERTILIZER AND SEED.

GROOVING SLOPES

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



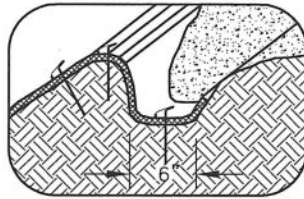
CITY OF CAMAS ~ EROSION CONTROL DETAIL
SURFACE ROUGHENING - STAIR STEPS & GROOVES

Sam P. Cothran 1-4-11
DETAIL APPROVED BY DATE

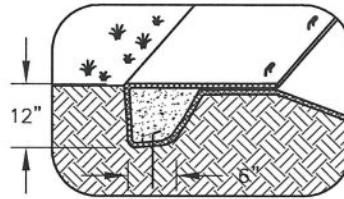
NOT TO SCALE

DETAIL NO.
EC19

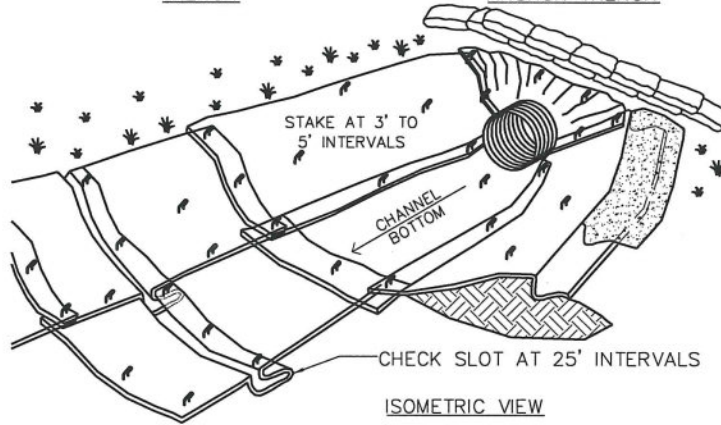
EC-ROUGHEN.DWG



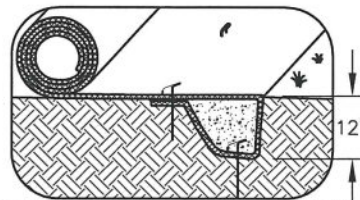
LONGITUDINAL ANCHOR TRENCH



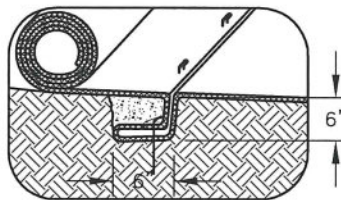
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH

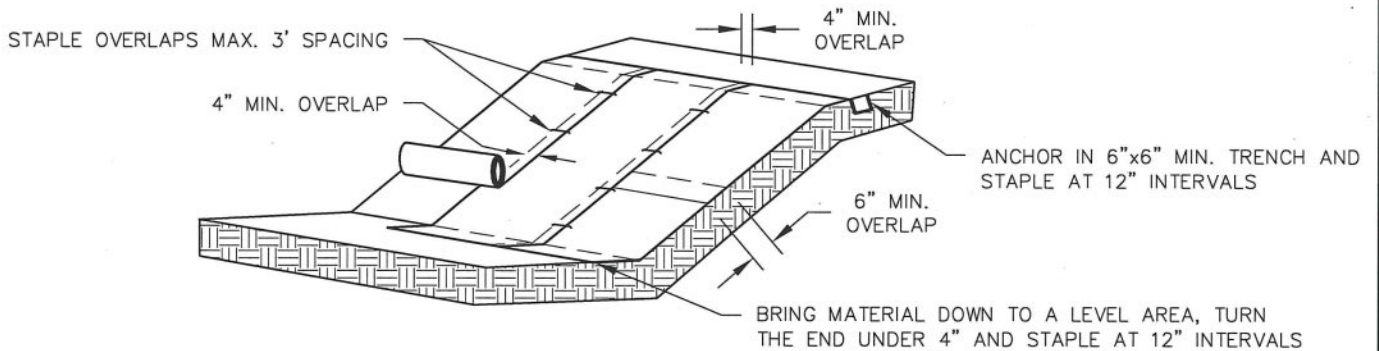


INTERMITTENT CHECK SLOT

NOTES:

1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURE'S SPECIFICATIONS.
2. STAKING OF STAPLING LAYOUT PER MANUFACTURES SPECIFICATIONS.

CHANNEL INSTALLATION



SLOPE INSTALLATION

NOTES:

1. SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT FOR PROPER SOIL CONTACT
2. DO NOT STRETCH BLANKETS/MATTINGS TIGHT, ALLOW THE ROLLS TO MOLD TO ANY IRREGULARITIES
3. STAPLING PATTERN AS PER MANUFACTURER'S RECOMMENDATIONS
4. IF THERE IS A BERM AT THE TOP OF SLOPE, ANCHOR UPSLOPE OF THE BERM
5. FOR SLOPES LESS THAN 3H:1V, ROLLS MAY BE PLACED IN HORIZONTAL STRIPS
6. LIME, FERTILIZE AND SEED BEFORE INSTALLATION. PLANTING OF SHRUBS, TREES, ETC. SHOULD OCCUR AFTER INSTALLATION.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



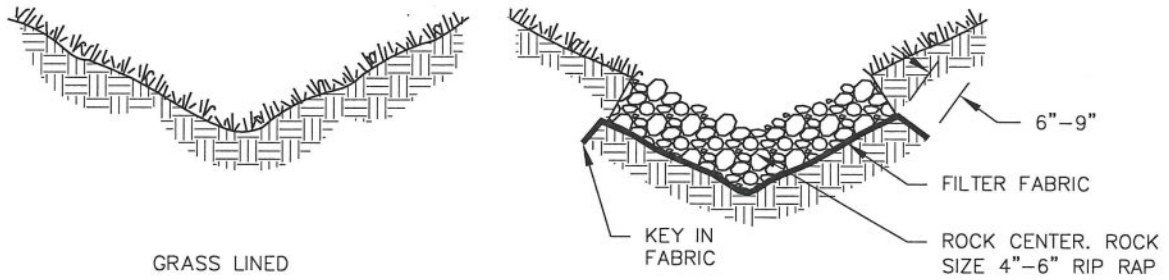
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 EROSION CONTROL BLANKETS

James P. Carleton 1-4-11
 DETAIL APPROVED BY DATE

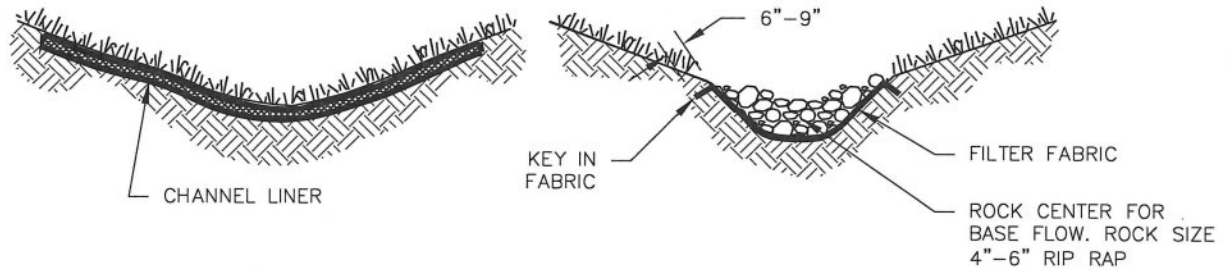
DETAIL NO.
 EC20

NOT TO SCALE

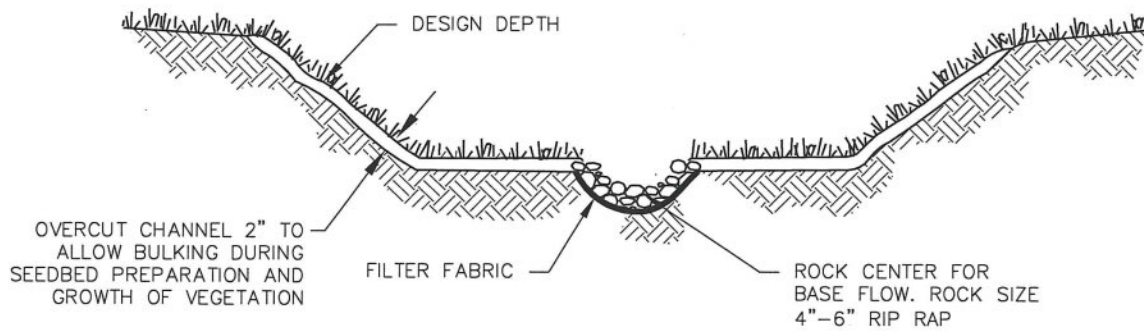
TYPICAL V-SHAPED CHANNEL CROSS-SECTION



TYPICAL PARABOLIC CHANNEL CROSS-SECTION



TYPICAL TRAPEZOIDAL CHANNEL CROSS-SECTION



NOTES:

1. ESTABLISHED GRASS OR VEGETATED LINING IS REQUIRED BEFORE THE CHANNEL CAN BE USED TO CONVEY STORMWATER, UNLESS STABILIZED WITH NETS OR BLANKETS.
2. IF DESIGN VELOCITY OF A CHANNEL TO BE VEGETATED BY SEEDING EXCEEDS 2 FT/SEC, A TEMPORARY CHANNEL LINER IS REQUIRED.
3. SIDE SLOPES SHALL BE 3:1 OR FLATTER TO AID IN THE ESTABLISHMENT OF VEGETATION AND FOR MAINTENANCE.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

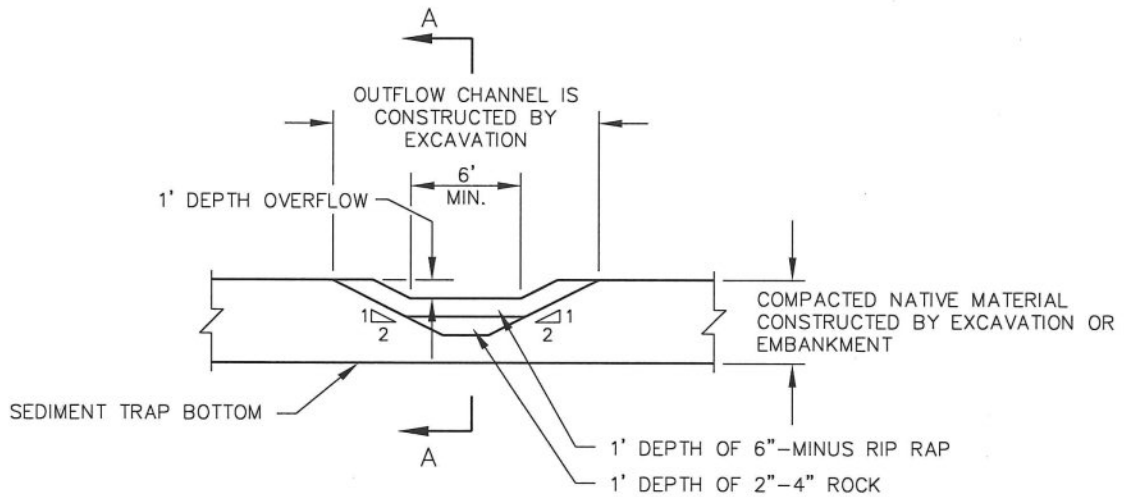


CITY OF CAMAS ~ EROSION CONTROL DETAIL
GRASS LINED CHANNELS

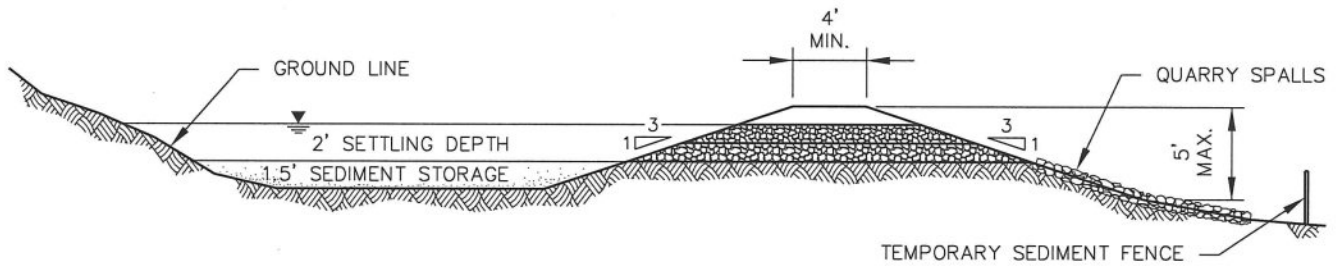
Don P. Caruthers 1-4-11
DETAIL APPROVED BY DATE

DETAIL NO.
EC21

NOT TO SCALE



ELEVATION



SECTION A-A

NOTES:

- ENGINEER TO PROVIDE CONTRACTOR WITH REQUIRED SEDIMENT STORAGE VOLUME (RSSV) IN CUBIC FEET (TONS X 0.5 TONS/CE).
FOOTPRINT = RSSV (1.5' MAX) + 2' SETTLING VOLUME DEPTH WITH 3:1 MAX SIDE SLOPES
A 3:1 RATIO OF TRAP LENGTH TO WIDTH IS DESIREABLE.
- A FILTER SYSTEM MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE SEDIMENT TRAP PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

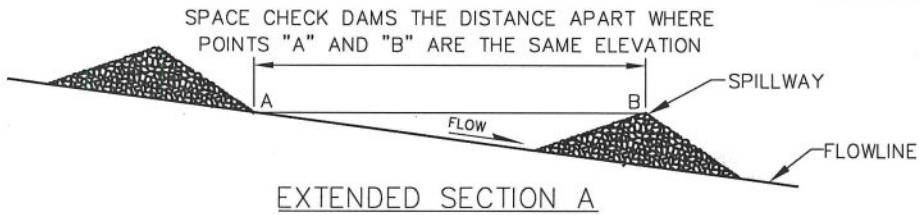


CITY OF CAMAS ~ EROSION CONTROL DETAIL
TEMPORARY SEDIMENT TRAP

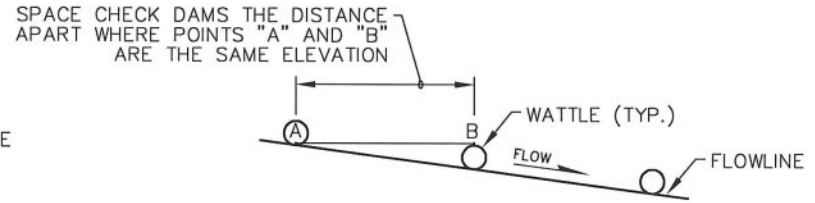
DETAIL APPROVED BY *Jan P. Cauffman* 1-4-11
DATE

DETAIL NO.
EC22

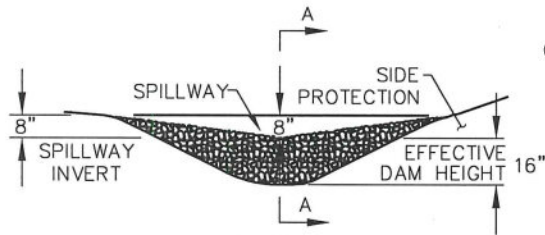
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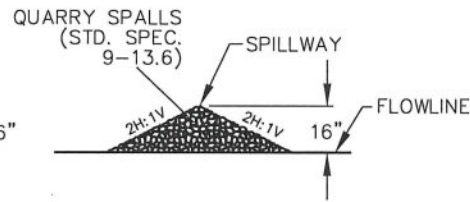
EXTENDED SECTION A



EXTENDED SECTION C



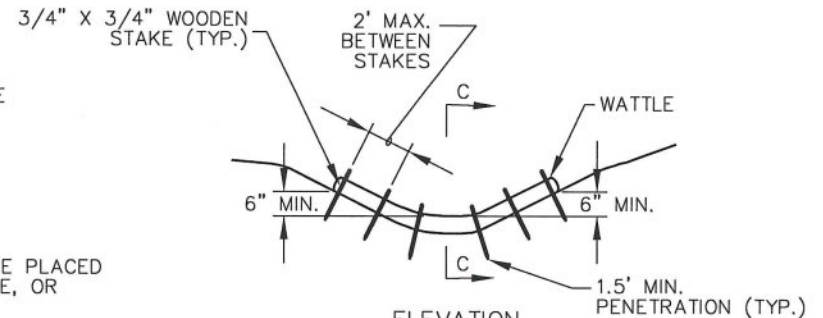
ELEVATION
(DITCH OR SWALE
CROSS SECTION)



SECTION A

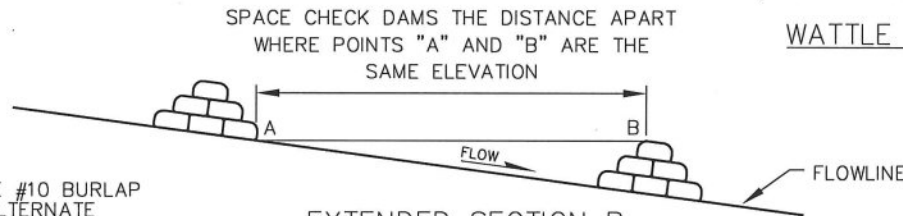
NOTE:
ROCK CHECK DAMS SHALL BE PLACED
OUTSIDE OF THE CLEAR ZONE, OR
BEHIND TRAFFIC BARRIER.

ROCK CHECK DAM



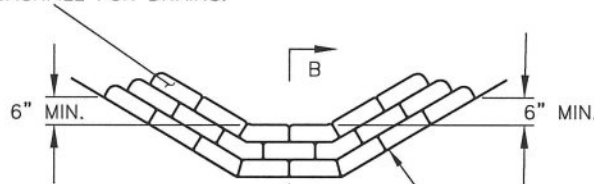
ELEVATION
(DITCH OR SWALE CROSS SECTION)

WATTLE CHECK DAM



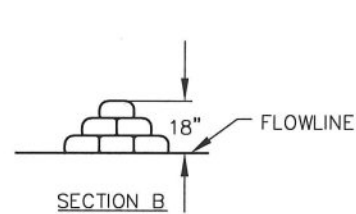
EXTENDED SECTION B

SACKS SHALL BE #10 BURLAP
OR APPROVED ALTERNATE
FILLED WITH 48 TO 55 LBS. OF
GRAVEL BACKFILL FOR DRAINS.



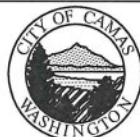
ELEVATION
(DITCH OR SWALE CROSS SECTION)

SANDBAG CHECK DAM



SECTION B

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

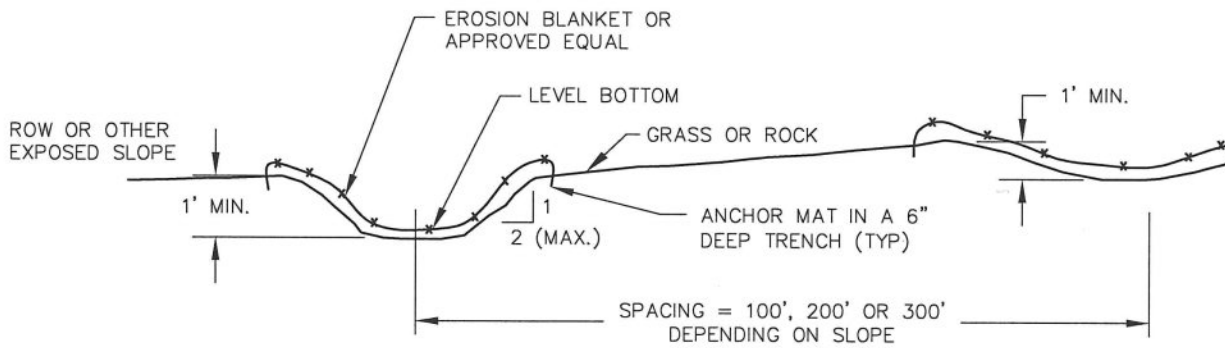


CITY OF CAMAS ~ EROSION CONTROL DETAIL
CHECK DAMS

DETAIL APPROVED BY *Jim P. Christian* 1-4-11
DATE

DETAIL NO.
EC23

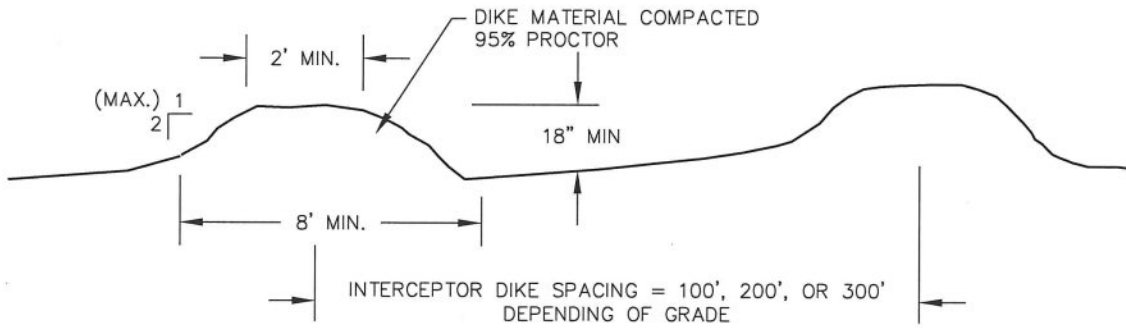
NOT TO SCALE



NOTE:
 WHERE OVERLAPPING OF EROSION BLANKET IS NECESSARY, OVERLAP EDGES A MINIMUM OF 4" AND STAPLES DOWN CENTER OF OVERLAP EVERY 3 FEET.

BOTTOM WIDTH: 2' MINIMUM; THE BOTTOM WIDTH SHALL BE LEVEL
 DEPTH: 1' MINIMUM
 SIDE SLOPE: 2H:1V OR FLATTER
 GRADE: MAXIMUM 5 PERCENT, WITH POSITIVE DRAINAGE TO A SUITABLE OUTLET (SUCH AS SEDIMENTATION POND)

INTERCEPTOR SWALE



TEMPORARY INTERCEPTOR DIKES

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC



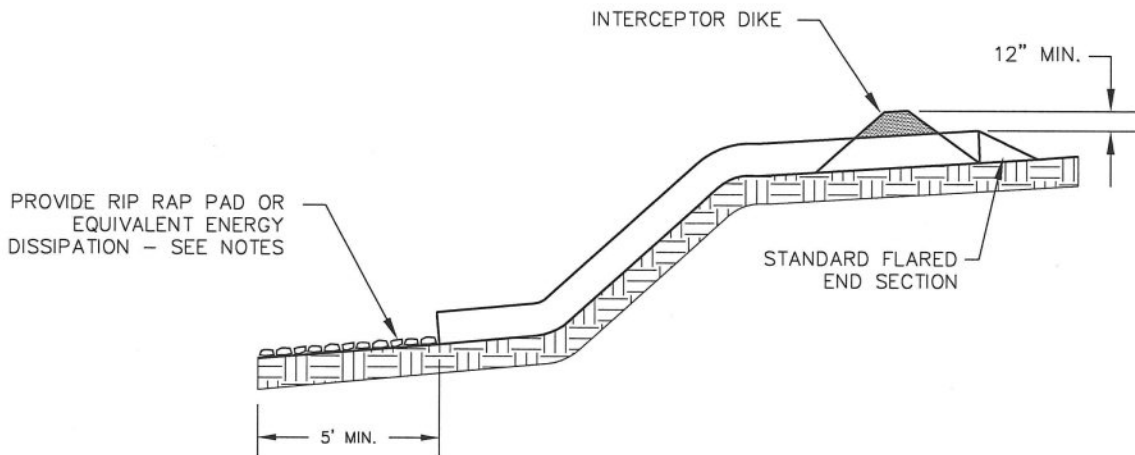
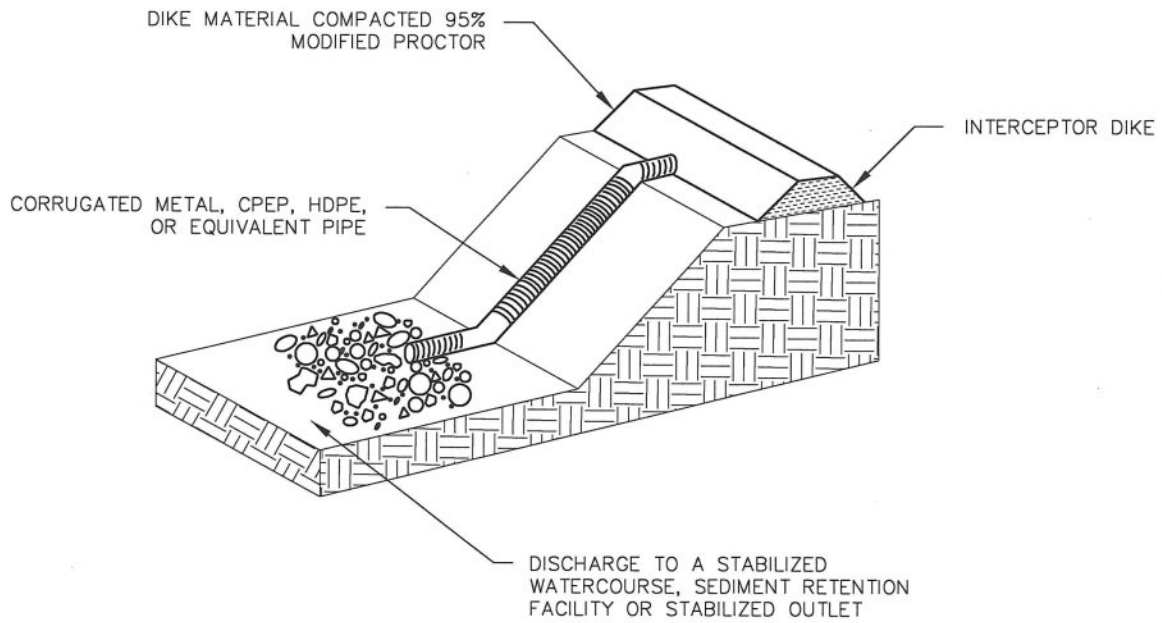
CITY OF CAMAS ~ EROSION CONTROL DETAIL
 INTERCEPTOR SWALE AND DIKE

James P. Carstensen 1-4-11
 DETAIL APPROVED BY DATE

DETAIL NO.
 EC24

NOT TO SCALE

EC-INTSW.DWG



NOTES:

1. PIPE INLET AND ALL SECTIONS SHALL BE SECURELY FASTENED TOGETHER WITH GASKETED WATERTIGHT FITTINGS.
2. SLOPE PIPE SHALL BE SECURELY ANCHORED TO THE SLOPE EVERY 10' OF PIPE LENGTH.
3. SOIL AROUND AND UNDER PIPE ENTRANCE SECTION SHALL BE THOROUGHLY COMPACTED TO PREVENT UNDERCUTTING. THIS AREA SHALL BE REINFORCED WITH SANDBAGS IF REQUIRED.
4. ENERGY DISSIPATION PAD SHALL BE FOUR FEET WIDER THAN THE PIPE DIAMETER; PIPE OUTLET SHALL BE CENTERED ALONG THE HIGH SIDE OF THE PAD

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CITY OF CAMAS ~ EROSION CONTROL DETAIL
PIPE SLOPE DRAIN

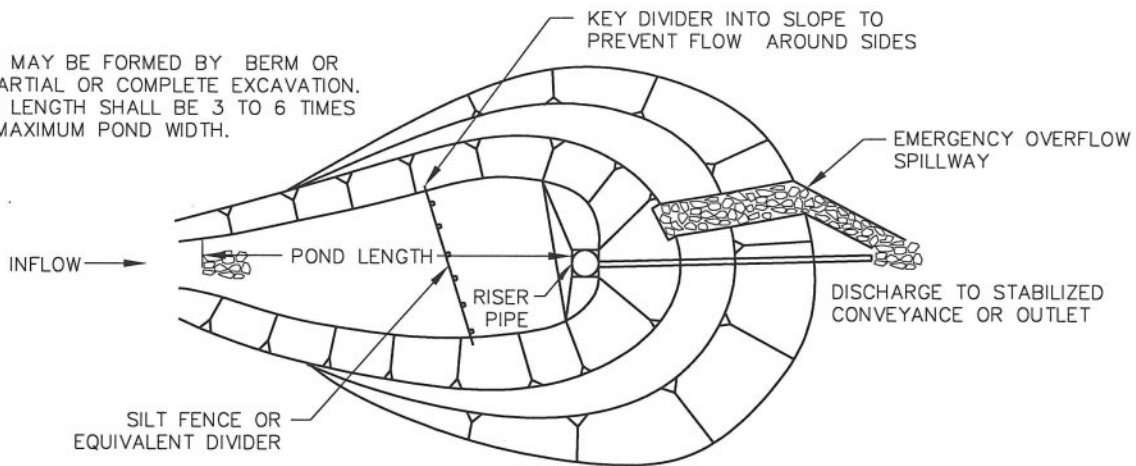
Don E. Coathran 1-4-11
 DETAIL APPROVED BY _____ DATE _____

DETAIL NO.
 EC25

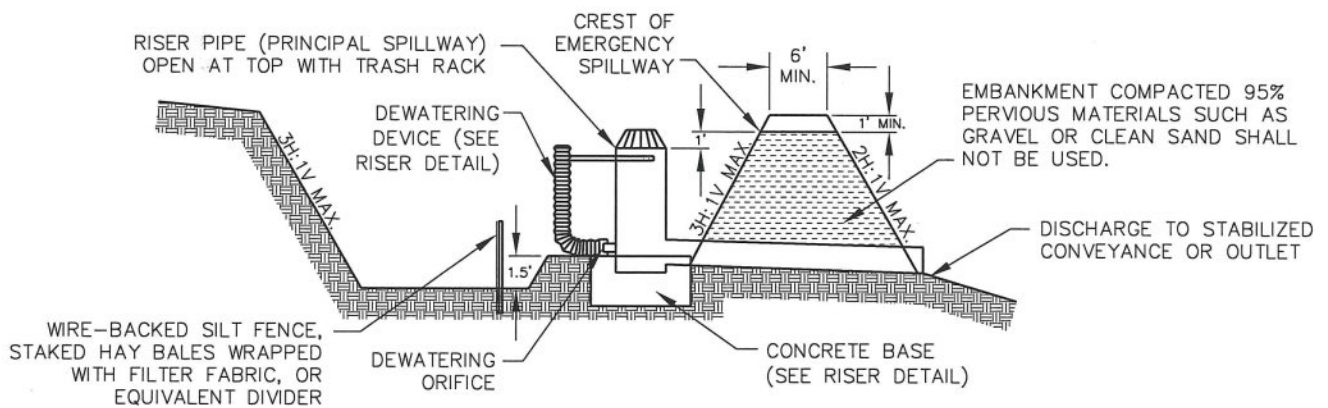
NOT TO SCALE

NOTES:

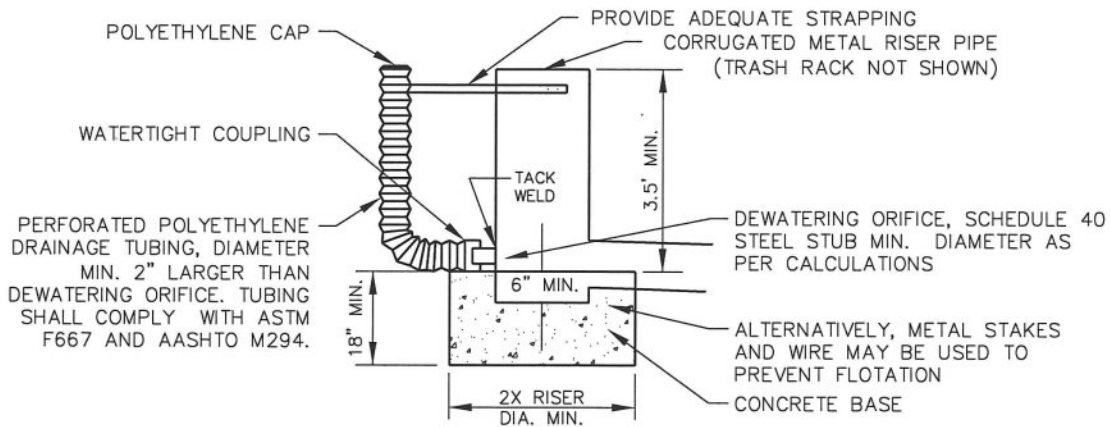
1. POND MAY BE FORMED BY BERM OR BY PARTIAL OR COMPLETE EXCAVATION.
2. POND LENGTH SHALL BE 3 TO 6 TIMES THE MAXIMUM POND WIDTH.



PLAN VIEW



CROSS SECTION



RISER DETAIL

NOTES:

1. STRUCTURES HAVING A MAXIMUM STORAGE CAPACITY AT THE TOP OF THE DAM OF 10 ACRE-FT (435,600 CU. FT.) OR MORE ARE SUBJECT TO THE WASHINGTON DAM SAFETY REGULATIONS (CHAPTER 173-175 WAC).
2. SIZING FOR POND GEOMETRY AND DISCHARGE MECHANISMS SHALL BE CALCULATED PER THE MOST RECENT STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
3. GRADE BOTTOM OF BASIN AS LEVEL AS POSSIBLE.
4. SPILLWAY SHALL BE LINED WITH 6" MIN. RIPRAP.
5. ALL INLETS AND OUTLETS SHALL BE PROTECTED WITH RIPRAP.
6. IF THE POND POSES A SAFETY HAZARD, IT SHALL BE FENCED.
7. REMOVE SEDIMENT BEFORE 1-FOOT ACCUMULATES.

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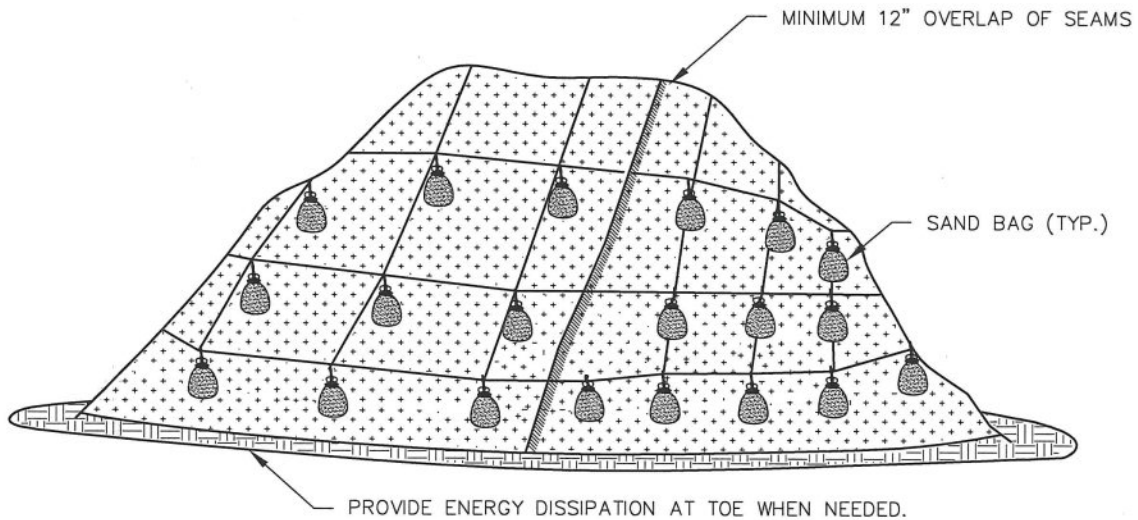
CITY OF CAMAS ~ EROSION CONTROL DETAIL
TEMPORARY SEDIMENT POND

James P. Coe 1-4-11
 DETAIL APPROVED BY DATE

DETAIL NO.
 EC26

NOT TO SCALE

EC-SED POND.DWG



PLASTIC SHEETING

NOTES:

1. PLASTIC SHEETING IS USED TO PROVIDE IMMEDIATE PROTECTION TO SLOPES AND STOCKPILES.
2. DO NOT USE PLASTIC COVERING UPSLOPE OF AREAS SUCH AS STEEP AND/OR UNSTABLE SLOPES THAT MIGHT BE ADVERSELY AFFECTED BY CONCENTRATED RUNOFF.
3. WHEN POSSIBLE, INSTALL AN INTERCEPTOR DIKE AT THE TOP OF THE PLASTIC TO DIVERT FLOWS AWAY FROM THE PLASTIC.
4. TOE-IN THE TOP OF THE SHEETING IN A 6"x6" TRENCH BACKFILLED WITH COMPACTED NATIVE MATERIAL.
5. INSTALL A GRAVEL BERM, RIPRAP, OR OTHER SUITABLE PROTECTION AT THE TOP OF THE SLOPE IN ORDER TO DISSIPATE RUNOFF VELOCITY.
6. ANCHOR THE PLASTIC USING SANDBAGS OR OTHER SUITABLE TETHERED ANCHOR SYSTEM SPACED ON A 10' GRID SPACING IN ALL DIRECTIONS.
7. OVERLAP SEAMS 1'-2', TAPE, ROLL AND STAKE THE SEAMS AND THEN WEIGH DOWN THE ENTIRE LENGTH.
8. PROVIDE ENERGY DISSIPATION AT TOE WHEN NEEDED.
9. REPLACE TORN SHEETS AND REPAIR OPEN SEAMS. COMPLETELY REMOVE AND REPLACE PLASTIC WHEN IT BEGINS TO DETERIORATE.

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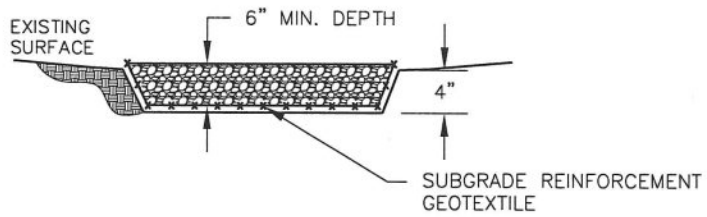


CITY OF CAMAS ~ EROSION CONTROL DETAIL
 STOCKPILE PROTECTION

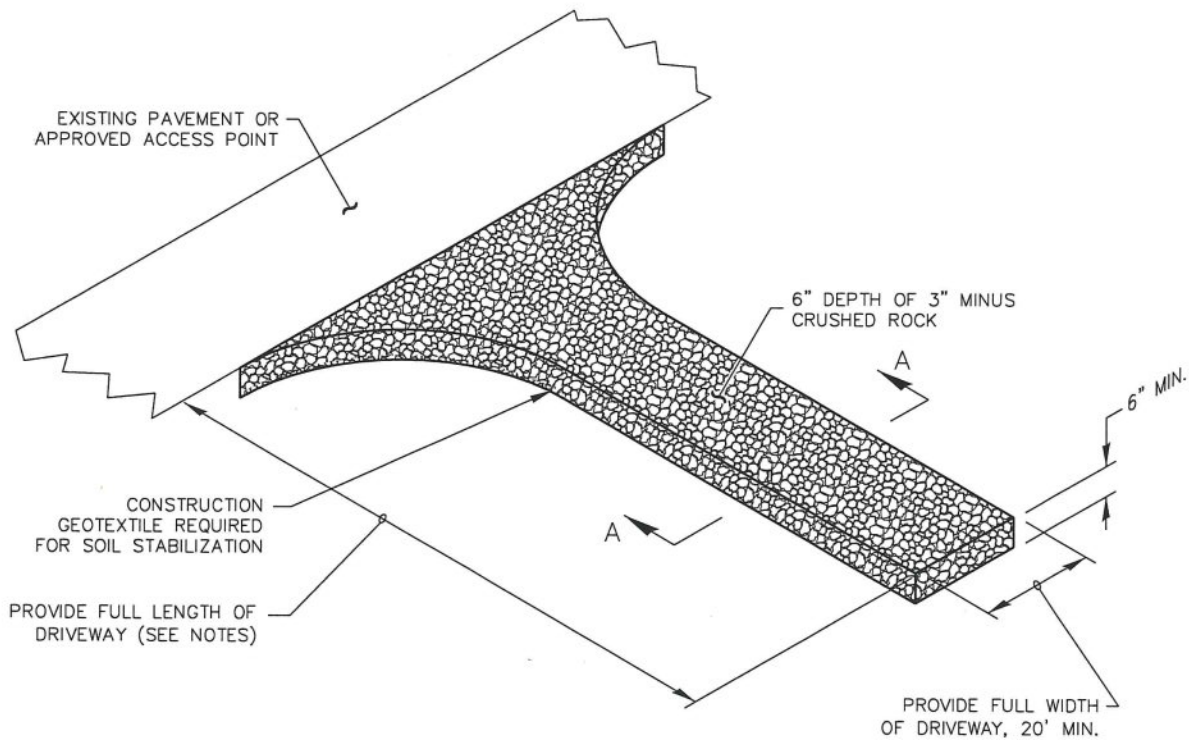
Sam P. Caruth 1-4-11
 DETAIL APPROVED BY DATE

DETAIL NO.
 EC27

NOT TO SCALE



SECTION A-A



ISOMETRIC VIEW

NOTES:

1. 20 FOOT MINIMUM LENGTH FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL.
2. ROCK SHALL BE REMOVED AND REPLACED, OR ADDITIONAL ROCK ADDED IF ENTRANCE FAILS TO FUNCTION AS INTENDED.

REV. NO.	DATE	BY	APPR.
1	6/11/12	SCD	JC



CITY OF CAMAS ~ EROSION CONTROL DETAIL
 CONSTRUCTION ENTRANCE FOR HOME BUILDERS

John P. Cauter 6-12-12
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DETAIL NO.
 EC28