

Erosion & Sediment Control Plan Implementation

Finding a Better Way

Christopher Hitch, P.E.
R.A. Smith National, Inc.

John Christiansen, P.E.
Super Western, Inc.

R.A. Smith National
*Beyond Surveying
and Engineering*

**SUPER
WESTERN**

MBA
METROPOLITAN
BUILDERS
ASSOCIATION

Objectives

- Identify “ISSUES” with erosion & sediment control plans (Things that drive contractors crazy!)
- Identify “ISSUES” with implementation plans (Things that drive engineers crazy!)
- Present a different approach to achieve better erosion & sediment control results
- Discuss ways to increase engineer and contractor collaboration

Erosion & Sediment Control Plan

- Required for construction sites with land disturbing activities of one acre or more (NR 216 sub chapter 3)
- Typically includes the following (at a minimum)
 - Flow diversion measures
 - Sediment trapping devices
 - Stabilization methods
 - General sequence of erosion & sediment control activities

The **DESIGN ENGINEER** is responsible for preparing the Erosion & Sediment Control Plan

Implementation Plan

- Often not required by governmental agencies
 - Is required by WisDOT
- Typically includes the following
 - Detailed sequence of erosion & sediment control activities
 - Additional Best Management Practices based on field conditions

The **CONTRACTOR** is responsible for preparing the Implementation Plan

Example Project

Hidden Whispering Meadow Ridge Rolling Creek Estates

Engineer: Ace – Impractical Design Associates

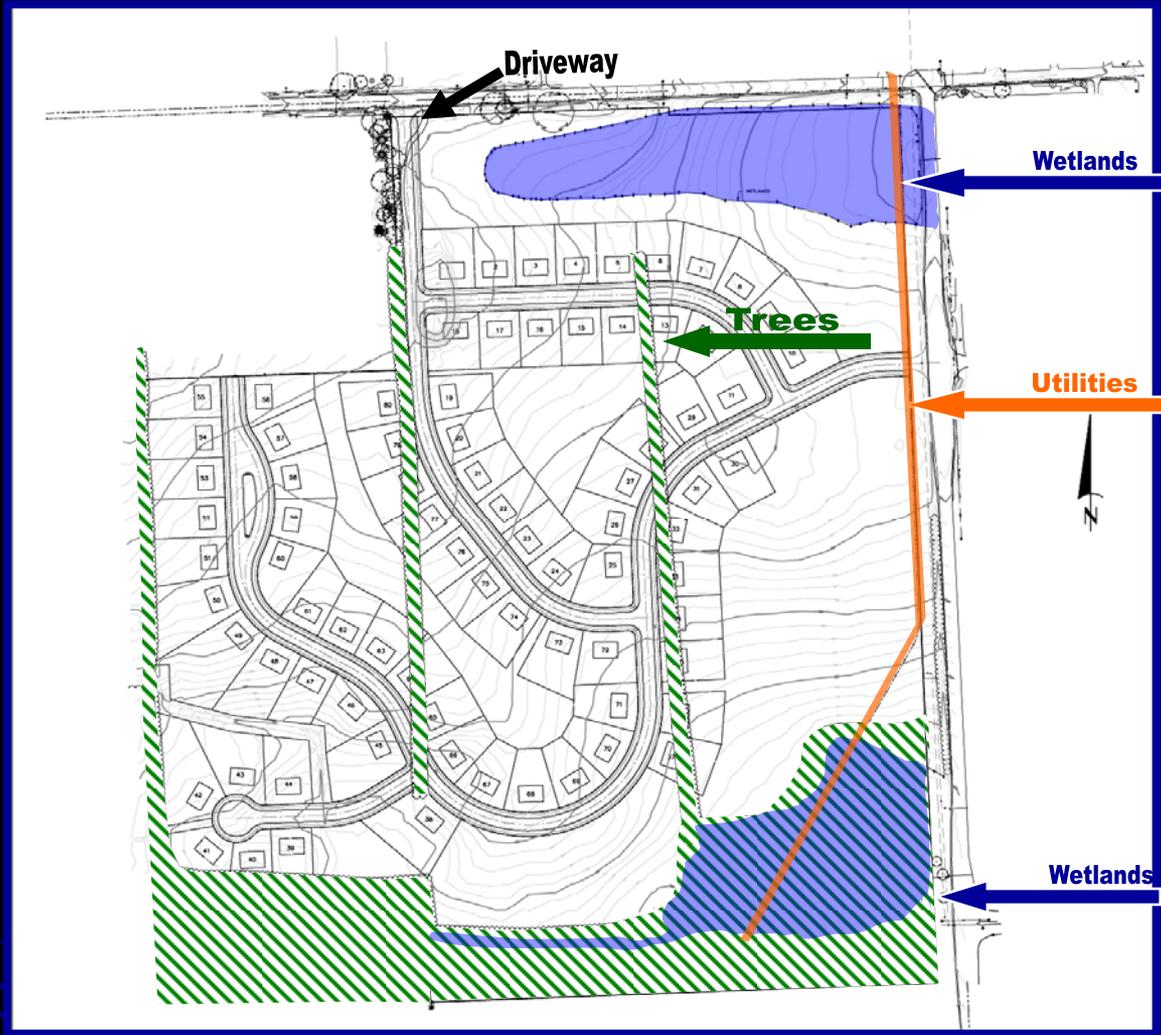
Contractor: Junior – Loose Cannon Construction

R.A. Smith National
*Beyond Surveying
and Engineering*

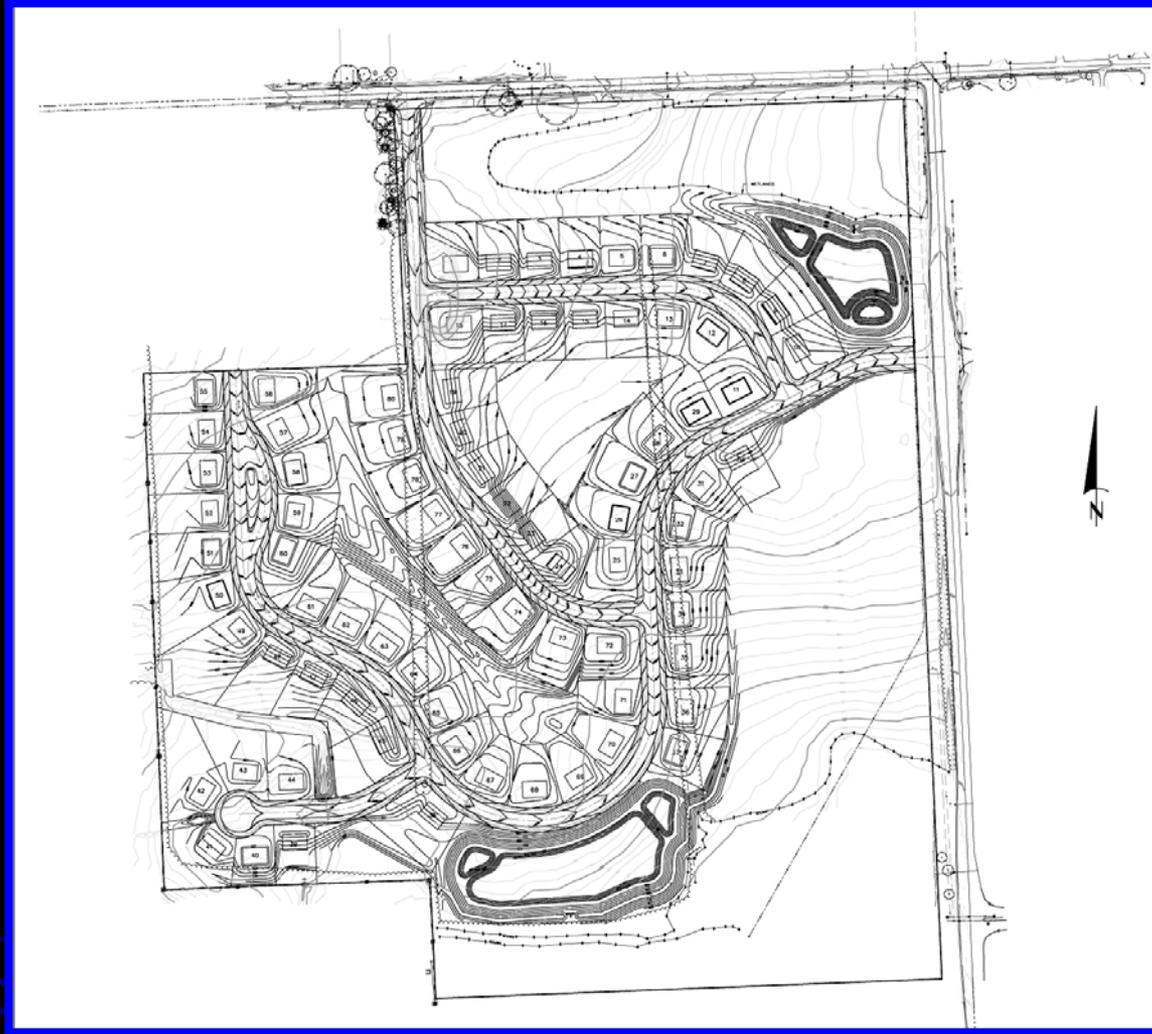


**SUPER
WESTERN**

Site Plan



Grading Plan



R.A. Smith National

*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Impractical Design Associates Sequence

- Step # 1 Install tracking pad
- Step # 2 Install silt fence
- Step # 3 Construct sediment basins
- Step # 4 Construct diversion swales
- Step # 5 Install ditch checks

- Step # 6 Clear trees
- Step # 7 Strip & stockpile topsoil
- Step # 8 Grade site
- Step # 9 Stabilize site using topsoil, seed, and mulch/blanket
- Step #10 Remove erosion control measures once site is stabilized

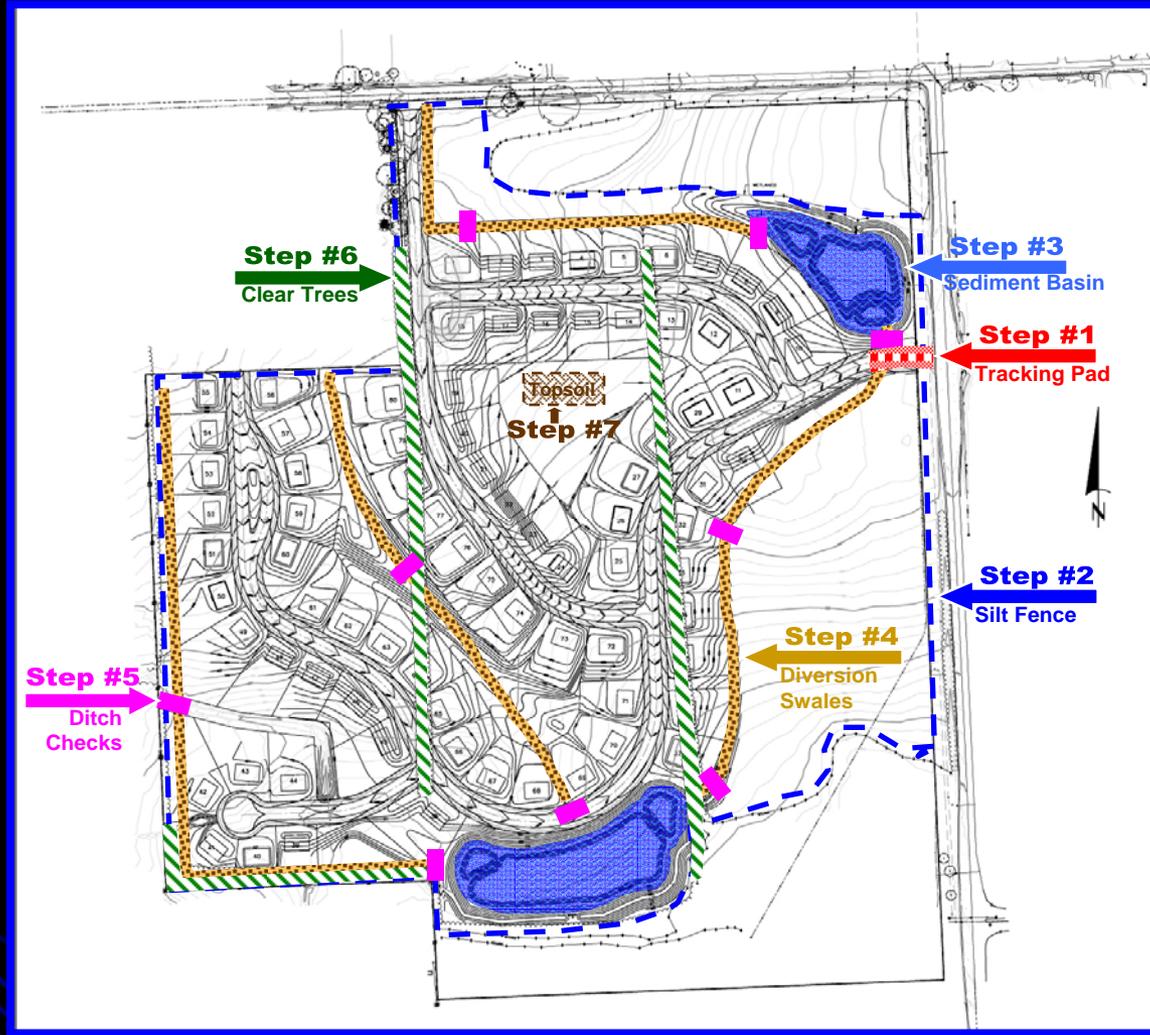
R.A. Smith National

*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Erosion & Sediment Control Plan



Loose Cannon Construction Sequence

Step # 1 Clear trees

Step # 2 Stone at construction entrance

Step # 3 Install silt fence

Step # 4 Grade entire site

Step # 5 Apply topsoil & seed

Implementation Plan

“The same dam way we’ve been doing it for the past 25 years”

Erosion & Sediment Control Plan Issues

(Things that drive contractors crazy!)

- Tracking pad located where it will need to be moved later during construction
- Tracking pad required to have geotextile, regardless of site conditions
- Silt fence required to be installed before tree clearing
- Silt fence required to be installed everywhere

Silt Fence (1056)

**Silt Fence
(1056)**

Wisconsin Department of Natural Resources
Conservation Practice Standard

I. Definition

Silt fence is a temporary sediment barrier of entrenched permeable geotextile fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff from small areas of disturbed soil.

II. Purpose

The purpose of this practice is to reduce slope length of the disturbed area and to intercept and retain transported sediment from disturbed areas.

III. Conditions Where Practice Applies

A. This standard applies to the following applications:

1. Erosion occurs in the form of *sheet and rill erosion*¹. There is no concentration of water flowing to the barrier (*channel erosion*).
2. Where adjacent areas need protection from sediment-laden runoff.
3. Where effectiveness is required for one year or less.
4. Where conditions allow for silt fence to be properly entrenched and staked as outlined in the Criteria Section V.

B. Under no circumstance shall silt fence be used in the following applications:

1. Below the ordinary high watermark or placed perpendicular to flow in streams, swales, ditches or any place where flow is concentrated.
2. Where the maximum gradient upslope of the fence is greater than 50% (2:1).

IV. Federal, State, and Local Laws

Users of this standard shall be aware of applicable federal, state, and local laws, rules, regulations, or permit requirements governing the use and placement of silt fence. This standard does not contain the text of federal, state, or local laws.

V. Criteria

This section establishes the minimum standards for design, installation and performance requirements.

A. Placement

1. When installed as a stand-alone practice on a slope, silt fence shall be placed on the contour. The parallel spacing shall not exceed the maximum slope lengths for the appropriate slope as specified in Table 1.

Slope	Fence Spacing
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 33%	25 feet
> 33%	20 feet

2. Silt fences shall not be placed perpendicular to the contour.
3. The ends of the fence shall be extended upslope to prevent water from flowing around the ends of the fence.

B. Height – Installed silt fences shall be a minimum 14 inches high and shall not exceed 28 inches in height measured from the installed ground elevation.

Conservation Practice Standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your local WDNR office or the Standards Oversight Council office in Madison, WI at (608) 833-1033. WDNR, WI 03/06

¹ Words in the standard that are shown in italics are described in X. Definitions. The words are italicized the first time they are used in the text.

**Silt Fence
(1056)**

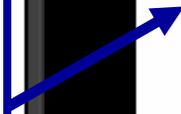
Wisconsin Department of Natural Resources
Conservation Practice Standard

A. Placement

1. When installed as a stand-alone practice on a slope, silt fence shall be placed on the contour. The parallel spacing shall not exceed the maximum slope lengths for the appropriate slope as specified in Table 1.

Slope	Fence Spacing
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 33%	25 feet
> 33%	20 feet

2. Silt fences shall not be placed perpendicular to the contour.



Erosion & Sediment Control Plan Issues

(Things that drive contractors crazy!)

- All sediment basins required to be constructed & stabilized before proceeding with remainder of site grading
- Diversion swales undersized and located in central portions of the site
- Topsoil stockpile locations and area available

R.A. Smith National
*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Implementation Plan Issues

(Things that drive engineers crazy!)

- There is no implementation plan
- Tracking pad not deep enough or long enough
- Tracking pad not maintained during construction
- Silt fence installed incorrectly
- Ditch checks installed incorrectly
- Grading entire site before sediment basin is constructed
- Inappropriate seeding/stabilization techniques for weather conditions
- Temporary outlet control on sediment basins never removed

There has to be a better way!

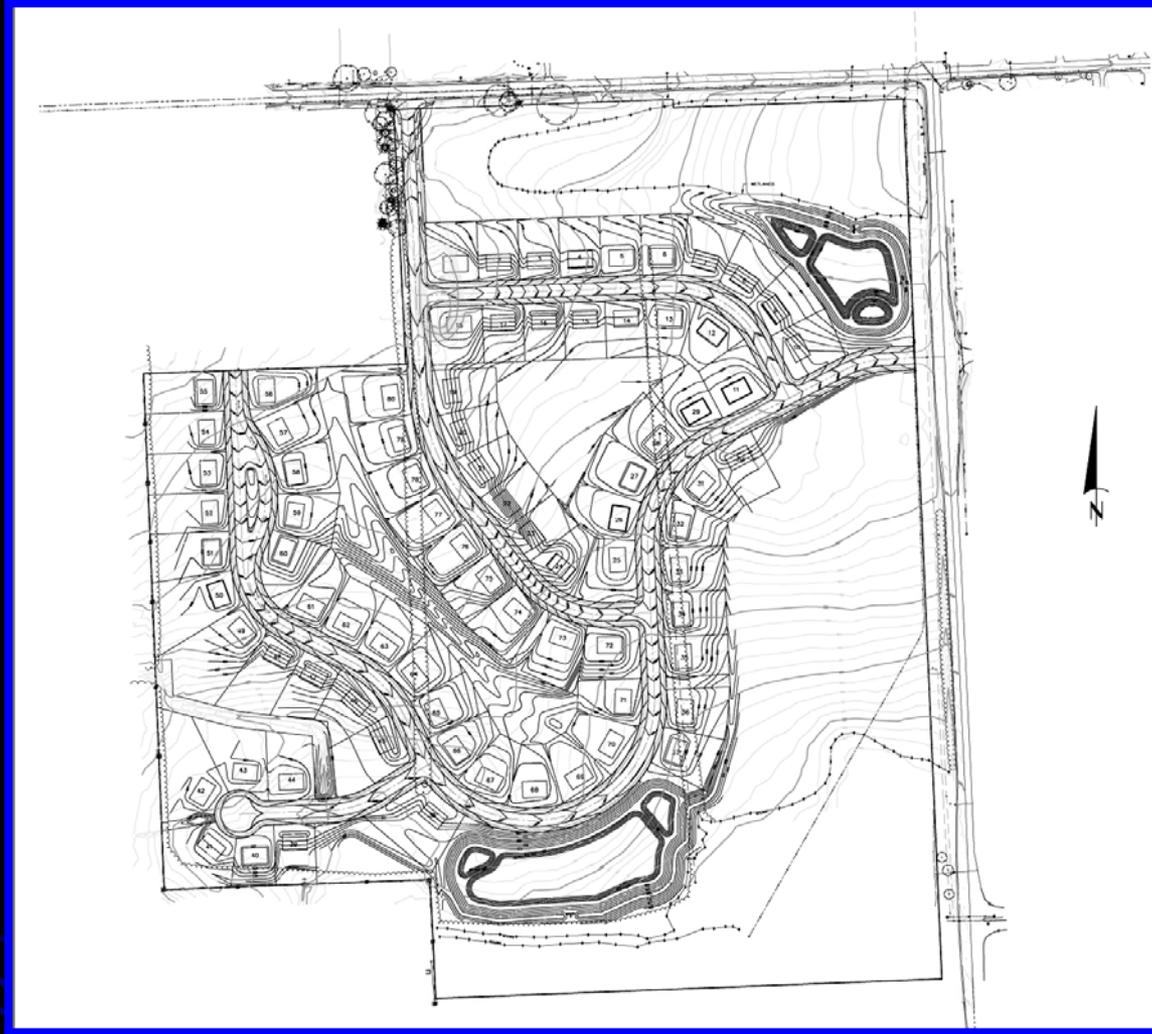
COLLABORATION

R.A. Smith National
*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Grading Plan



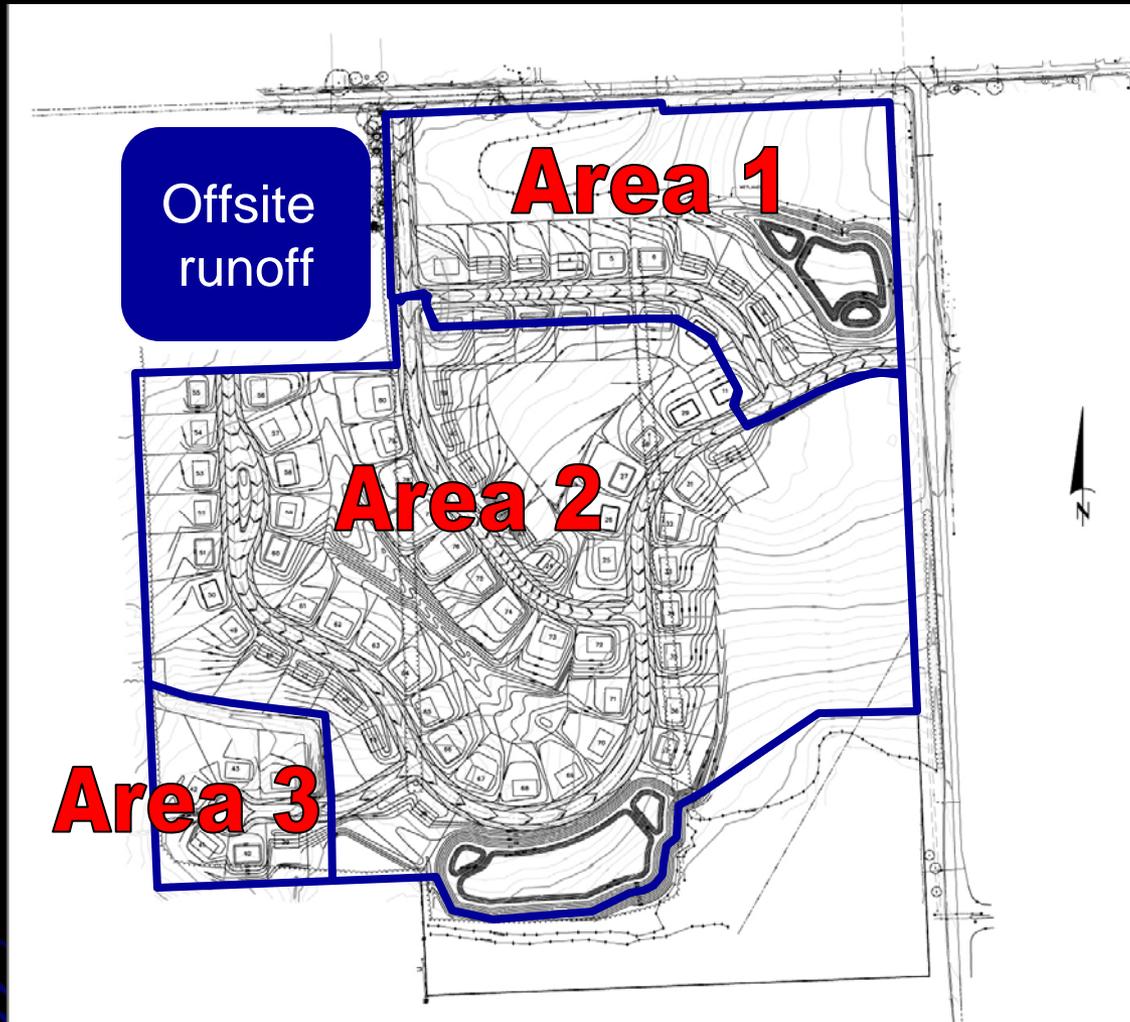
R.A. Smith National

*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Drainage Area Basins



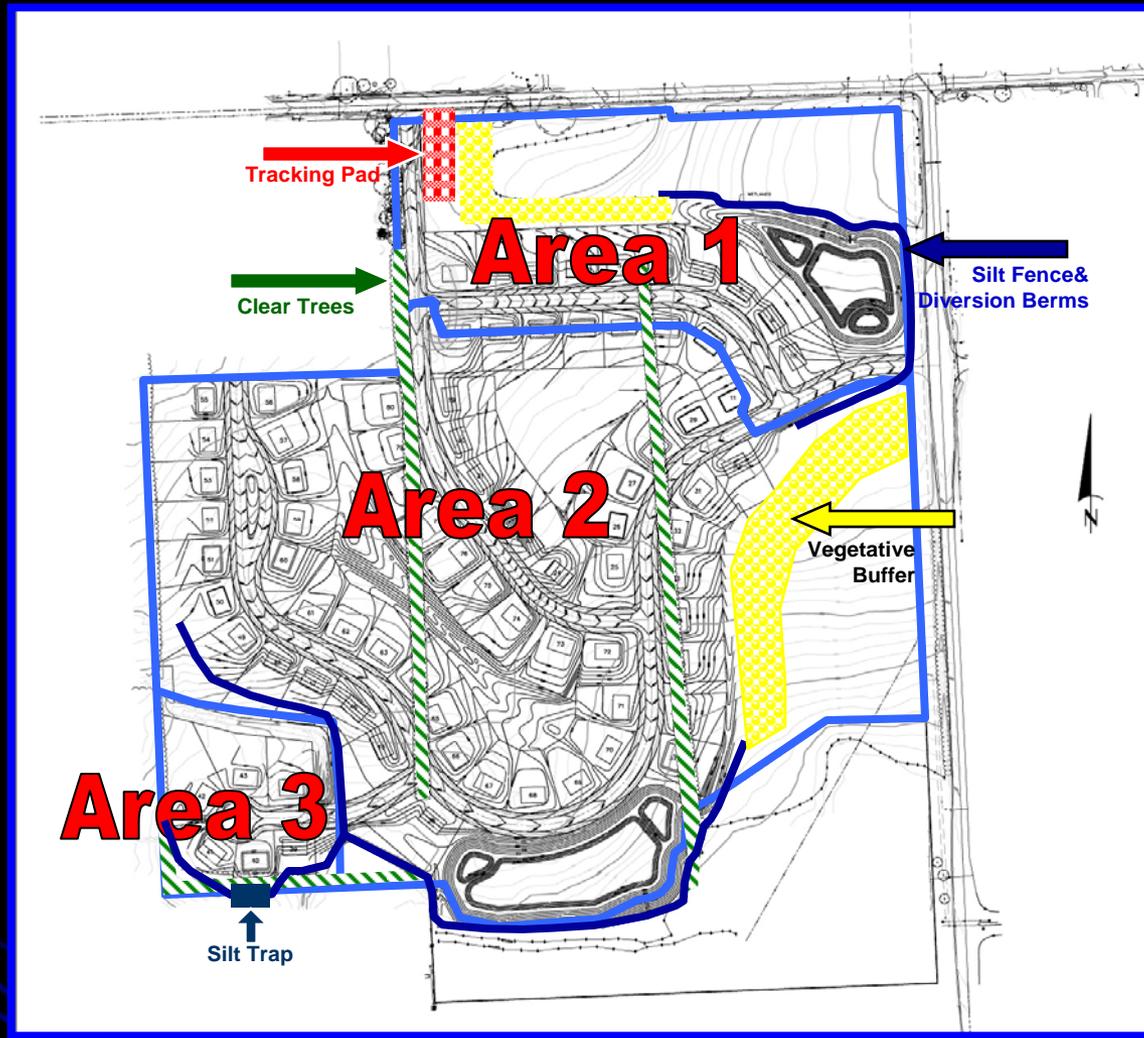
Construction Sequence / Implementation Plan

- Step # 1 All work to be completed in accordance with WDNR Technical Standards
- Step # 2 Install tracking pad
- Step # 3 Clear trees – Grind stumps in lieu of grubbing in sensitive areas
- Step # 4 Secure the site with silt fence in combination with diversion berms constructed of topsoil – Utilize vegetation buffers

Construction Sequence / Implementation Plan

- Step # 5 Construct initial sedimentation basin and/or sediment traps in drainage area #1. Topsoil stockpile to remain within drainage area #1 – also strip the fill area within drainage area #1 (consider where the clay will come from for the clay liner)
- Step # 6 Grade the remainder of drainage area #1 and start underground utility construction
- Step # 7 Start construction of drainage area #2 either consecutively or concurrently with previously drainage area. Topsoil stockpiles and fill areas must remain within current drainage area or within previous drainage area with a completed basin or trap

Erosion & Sediment Control Plan



R.A. Smith National

*Beyond Surveying
and Engineering*



**SUPER
WESTERN**

Ways to Increase Engineer & Contractor Collaboration

Engineers

- Understand construction techniques/practices
- Know your contractors and be willing to ask them questions

Contractors

- Understand design/permit requirements
- Acknowledge that erosion & sediment control is continually evolving

Owners

- Engage your contractor early in the process
- Conduct a plan implementation meeting

Summary

- Identified common erosion & sediment control plan issues
- Identified common implementation plan issues
- Presented a different approach to achieve better erosion & sediment control results
- Discussed ways to increase engineer and contractor collaboration

Questions?

Christopher Hitch, P.E.
R.A. Smith National, Inc.

John Christiansen, P.E.
Super Western, Inc.

R.A. Smith National
*Beyond Surveying
and Engineering*

**SUPER
WESTERN**

MBA
METROPOLITAN
BUILDERS
ASSOCIATION