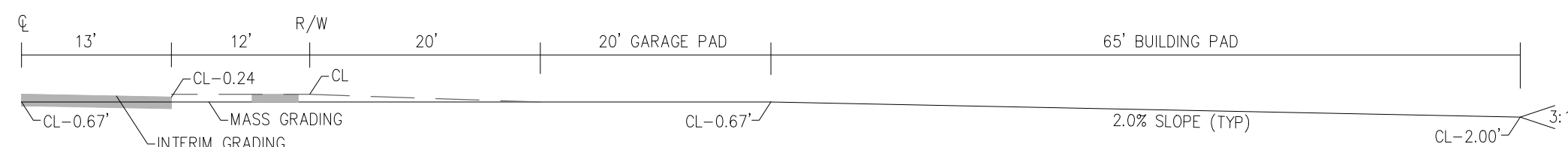


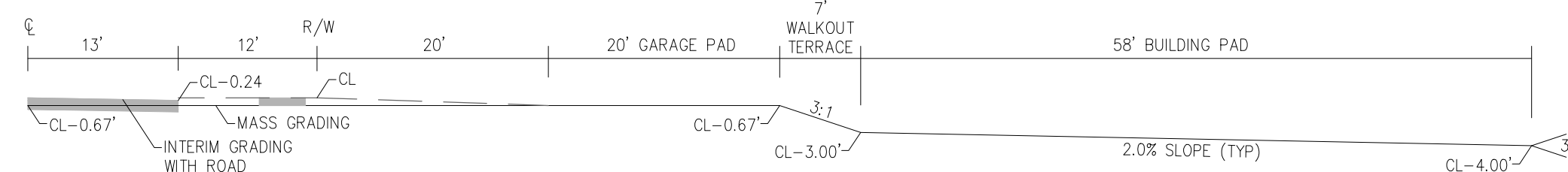
	TRAP/ BASIN	TOTAL DRAINAGE AREA (AC)	DISTURBED DRAINAGE AREA (AC)	UN-DISTURBED DRAINAGE AREA (AC)	15 YEAR 20 MINUTE DESIGN FLOW (CFS)	2 YEAR SEDIMENT STORAGE VOLUME* (CU.FT.)	STORAGE VOLUME** (CU.FT.)	TOTAL STORAGE VOLUME REQUIRED (CU.FT.)	SEDIMENT TRAP/ BASIN DEPTH (FT)	TOTAL STORAGE VOLUME PROVIDED (CU.FT.)	SPILLWAY ELEVATION (FT)	SPILLWAY WIDTH (FT)	100 YR 20 MINUTE DESIGN FLOW (CFS)	100 YR 20 MINUTE ELEVATION (FEET)	TOP OF BERM
TRAP	"A"	1.93	1.93	0.00	5.52	676	6,948	7,624	3	8,715	512.00	10.00	8.72	512.44	514.00
TRAP	"B"	1.89	1.89	0.00	5.41	662	6,804	7,466	3	8,715	514.00	10.00	8.54	514.43	516.00
TRAP	"C"	2.68	1.95	0.73	6.94	938	9,648	10,586	3	10,586	512.10	10.00	10.97	512.61	514.00
TRAP	"D"	0.82	0.82	0.00	2.35	287	2,952	3,239	3	3,239	512.50	10.00	3.71	512.75	514.00
TRAP	"E"	2.48	1.73	0.75	6.35	868	8,928	9,796	3	10,015	514.00	10.00	10.03	514.48	516.00
		* From Annual Sediment Storage 405 Attachment 1:3													
		** = disturbed drainage area * 3,600													
			15YR 20MIN PI	100YR 20MIN PI											
	DISTURBED	2.86	4.52												
	OFF-SITE	2.85	4.50												
	UNDISTURBED	1.87	2.95												

GRADING PLAN TEMPLATES



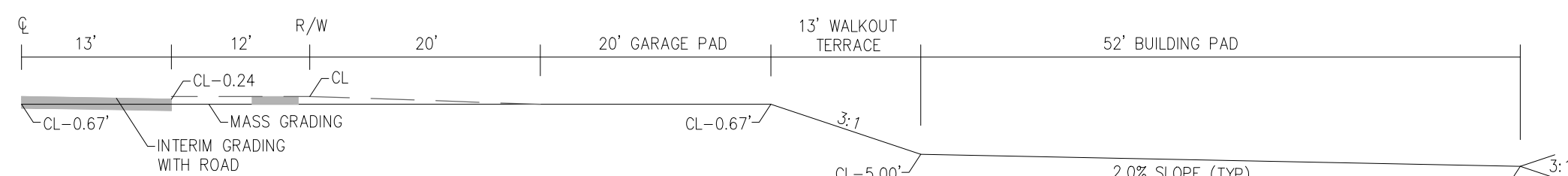
TYPICAL SINGLE FAMILY STANDARD LOT TEMPLATE

(8" BELOW CENTERLINE PROFILE GRADE, FLAT TO BUILDING PAD THEN 2% GRADE THROUGH THE LOT) NOT TO SCALE



TYPICAL SINGLE FAMILY LOOKOUT LOT TEMPLATE

(8" BELOW CENTERLINE PROFILE GRADE, FLAT TO GARAGE PAD, 2" FALL TERRACE AND THEN 2% GRADE THROUGH THE LOT) NOT TO SCALE



TYPICAL SINGLE FAMILY WALKOUT LOT TEMPLATE

(8" BELOW CENTERLINE PROFILE GRADE, FLAT TO GARAGE PAD, 4" FALL TERRACE AND THEN 2% GRADE THROUGH THE LOT) NOT TO SCALE

Troubleshooting

- Consult with a registered design professional if any of the following occur:
 - Variations in topography on-site indicate sediment trap will not function as intended.
 - Design specifications for fill, pipe, seed variety or seeding dates cannot be met; substitutions may be required. Unapproved substitutions could lead to failure.

Common Problems and Solutions

Problem	Solution
Embankment overtopping and possible failure of the structure; caused by inadequate spillway size.	Increase size of spillway.
Overtopping and possible failure; caused by extensive embankment settling.	Add additional fill to bring embankment back to design grade.
Erosion and displacement of rock; caused by rock outlet apron not extending to stable grade.	Extend apron.
Erosion of spillway or embankment slopes; caused by inadequate vegetation or rock size in spillway too small.	Improve vegetation, incorporate rolled erosion control product, or replace rock with larger size.
Settling of embankment; caused by inadequate compaction or use of unsuitable soil.	Add fill in settled areas to restore embankment to original grade.
Structural failure; caused by inadequate compaction due to construction with dry soil.	Replace failed material and compact to original grade.
Slumping failure; caused by overly steep slopes.	Repair damage and flatten slope without reducing the storage volume.
Piping failure; caused by too steep of a slope between stone spillway and earth embankment.	Flatten slope, then repair piping damage.
Inadequate storage capacity; caused by sediment not being properly removed.	Remove sediment on a regular schedule.
Inadequate storage capacity; caused by having a greater area contributing sediment than originally designed.	Stabilize the disturbed area contributing to the trap or regrade the construction site and add additional traps to better distribute sediment laden storm water among the traps to handle the sediment discharging to the drainage area.
Safety or health hazard; caused by ponded water due to sediment clogging the gravel on the upstream slope of the riprap.	Remove sediment and install security fence if necessary.

Sediment Storage

A minimum of 3,600 cubic square per acre of drainage area or sufficient to safely pass run-off greater than the two-year frequency, 24-hour duration or design storm event.

Embankment

Dam Height
Less than five feet.

Top Width
At least five feet.

Fill Slopes
2.5:1 or flatter.

Settlement
10 percent or less.

Fill Material

Locally available soil; machine compacted in 8-inch lifts; moist when compacted; free of organic material, tree roots and waste material.

Spillway

A rock-lined open channel spillway should be constructed in the embankment to safely pass stormwater runoff. As an option, a perforated outlet riser can be used as the principal spillway.

Capacity

Sufficient to safely pass runoff from the two year frequency, 24-hour duration or design storm event.

Bottom Width

At least five feet.

Crest

A minimum of 18-inches lower than the top of the embankment.

Outlet

Include an apron at least five feet long to dissipate energy.

Filter

Geotextile should be placed between the embankment soil and the rock in the spillway section.

Construction

Site Preparation

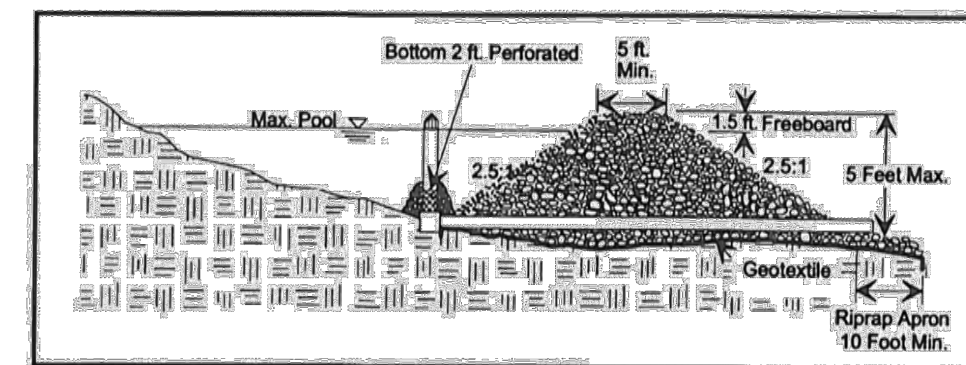
- Locate the temporary sediment trap in an upland area as close to the sediment source as possible, considering soil type, pool area, dam length and spillway conditions.
- Prior to excavation activities of any type, call 1-800-DIG-RITE (344-7483) to obtain utility locations.
- Follow all federal, state and local requirements on impoundment sites.
- Clear, strip and grub the foundation of the dam to minimum depth of 4-inches, removing all woody vegetation, rocks and other objectionable material. Dispose of trees, limbs, logs and other debris in designated disposal areas.
- Divert off-site run-on from all undisturbed areas away from the sediment trap.
- Excavate the sediment trap (if necessary), stockpiling and stabilizing any surface soil having high amounts of organic matter for later use.

Embankment

- Scarify the base of the embankment before placing fill.
- Use fill from predetermined borrow areas. Fill should be clean, stable mineral soil free of organics, roots, woody vegetation, rocks and other debris, and must be wet enough to form a ball without crumbling, yet not so wet that water can be squeezed out.
- Compact the fill material in 8-inch continuous layers (maximum) over the length of the dam. (One way is by routing construction equipment over the dam so each layer is traversed by at least one wheel of the equipment.)

Open Channel Spillway

- Excavate a trapezoidal outlet section in the compacted embankment.
 - Install geotextile fabric on the base of the channel, extending it up the sides to the top of the embankment.
 - Place specified stone to the lines and grades, working smaller stones into voids to achieve a dense mass. The spillway crest should be level with a minimum width of five feet.
 - Construct a stone outlet apron below the toe of the dam on level grade until a stable condition is reached (5-foot minimum).
 - The base of the stone outlet should be at least two feet thick.
 - Make the edges and end of the stone apron section flush with the surrounding ground.
 - Cover the inside face of the stone outlet section with a 1-foot layer of well graded stone (2-inch minus).
- Set a clean-out measurement stake in the basin at a height equal to one-half the distance from the bottom to the spillway crest.



Optional Spillway Riser Construction

- Clear all vegetation and roots from the pipe foundation; prepare the bedding.
- Situate the spillway pipe and riser (minimum 18-inch diameter) on a firm, even foundation.
- Align the pipe and construct with the bell end of the pipe facing upstream. Around the barrel, place a 4-inch layer of moist, clayey, workable soil (not pervious material, such as sand, gravel, or silt), and compact with hand tampers to at least the density of the foundation soil. Don't raise the pipe from the foundation when compacting under the pipe haunches. Connect the pipe to the riser.

Temporary Sediment Trap



Figure 6.73 Sediment traps are used to collect sediment laden runoff from disturbed areas on construction sites. (Source: EPA)

Recommended Minimum Requirements

Prior to start of construction, sediment traps should be designed by a registered design professional. The site superintendent and field personnel should refer to plans and specifications throughout the construction process. The sediment traps should be built according to planned grades and dimensions.

Location

- Where access can be maintained for sediment removal and proper disposal.
- Where runoff can be directed into basin at low velocity.

Drainage Area

- Below areas less than 5 acres in size. If the drainage area is larger, construct a sediment basin (see Sediment Basin).
- In the approach to a storm water inlet located below a disturbed area as part of an inlet protection system.
- Where failure of the structure will not result in loss of life, damage to homes, commercial or industrial buildings, main highways or railroads; or in the use or service of public utilities.

Structure Life

Limited to 18 months.

- Perforate the bottom 2 feet of spillway riser with 1/2 inch diameter holes spaced 3-inches apart (or use a manufactured perforated riser) for draining the sediment trap. Wrap the riser with geotextile fabric.
- Embed the riser at least 12-inches into concrete. The weight of the concrete should balance the buoyant force acting on the riser. Buoyant Force = Volume of Riser x 62.4 lbs./ft.³
- Surround the entire riser with two feet of clean uniformly graded stone.
- At the pipe outlet, install a riprap apron at least five feet wide and 10 feet long. The riprap should be a minimum of 6-inches in diameter (see Rock Outlets).
- Dewatering can also be accomplished with a skimmer (see Skimmers).

Erosion Control

- The size of disturbed areas should be minimized. Stabilize all disturbed areas immediately after construction. Establish vegetation and erosion controls within 14 days after construction is complete.
- Divert sediment-laden water to the upper end of the temporary sediment trap to improve trap effectiveness.
- Direct all runoff into the basin at low velocity.

Safety

- Because temporary sediment traps will likely impound water, the following precautions should be taken:
 - Avoid steep slopes; the slopes around the temporary sediment trap should be 2.5:1 or flatter; 3:1 if maintained by tractors or other machinery.
 - Fence area and post warning signs if trespassing is likely.

Construction Verification

- Check finished grades and dimensions of the temporary sediment trap.
- Check materials for compliance with specifications.

Maintenance, Inspection and Removal

- Inspect the temporary sediment trap weekly and after each storm event.
- Remove and properly dispose of sediment on an upland area to dry and be stabilized when it accumulates to one-half the design volume, as indicated by the clean-out stake.
- Periodically check the embankment, spillway and outlet apron for erosion damage, settling, seepage or slumping along the toe, and repair immediately.
- Replace the spillway gravel facing if it becomes clogged.
- Inspect vegetation and reseed if necessary.
- Replace any displaced riprap, being careful no replacement rock is above the design grade.
- Remove the temporary sediment trap after the drainage area has been permanently stabilized, inspected and approved. Do so by draining any water, removing the sediment to a designated disposal area, grading the site to blend with the surrounding area, then stabilize.
- Remove the temporary sediment trap and stabilize the site prior to filling. (Form H: Request for Termination of a General Permit, Form-MO 760-1409 (see Chapter One, Missouri Permit Requirements).

PROJECT TITLE
IMPROVEMENT PLANS
WABASH WOODS
PHASE TWO
DETAILS

PRS No. 15014KAPD00R
TASK 002

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KARL A. SCHOENIKE, P.E.
PROFESSIONAL ENGINEER LICENSE 2003015039

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DETAILS