

**Rock Embankment Slope Sliver Fills, Pub. 72M, RC-1X
Clearance Transmittal S-15-024, Step-1 External
September 28, 2015.**

No.	District	Contact	Page	Comments	Follow up by Work Group
1	CO	Daniel Clark	Mid Slope Sliver Fill	Pitch of benches: The embankment is presumed to be constructed of "earth" materials - generally a poorly draining material. The bottom bench is indicated to be pitched inwards on a 20:1 slope and constructed of rock - a highly permeable material. Water will tend to collect at the back of the bench until it soaks into the "earth" embankment. This may reduce the shear strength and increase the driving forces by the weight of the water. A forward 20:1 pitch will eliminate this problem and the additional driving forces resulting from the 20:1 inclination can usually be accommodated. THEREFORE it is recommended that the pitch on the bottom bench be reversed from 20:1 inwards to 20:1 outwards.	Agree that internal drainage should be improved as much as practical. We believe there is benefit in pitching the bottom of excavation 20:1 (5%) inward to a pipe in order to intercept groundwater deeper near the core of the slope. The drawback is that this requires slightly deeper excavation. We will change to show outward pitch but will keep the pipe at the interior base of excavation to guard against trapping water near the core. This is especially important if it is not possible to daylight the rock toe.
2	CO	Daniel Clark	Mid Slope Sliver Fill	Pitch of benches: The benches cut into the embankment are indicated (visually) to be horizontal. Cutting benches with a dozer is an imprecise art - dare I suggest that the benches are not going to be level when they are done. THEREFORE it is recommended that the benches be deliberately pitched 20:1 <u>outwards</u> like the recommendation for the bottom bench. You want any seepage that may collect along the new-old interface to follow the construction line down and out to a suitable outlet. Moreover, 6 to 12 inches of drainage gravel (with or without a drainage geotextile depending on need) placed along this interface would facilitate the internal drainage of any seepage encountered.	Sloping benches at 20:1 may offer a slight benefit to the internal drainage and is a constructable detail. Change incorporated. The 'panhandle' of rock has been removed from the detail.
3	CO	Daniel Clark	Mid Slope Sliver Fill	The other typical sections have additional criteria for the rock material. Please put that criteria on this section as well.	Agree. Slope details for soil and rock will be placed on one CT and the notes will be consolidated and revised..
4	CO	Daniel Clark	Rock Slope Sliver Fill	Pitch of benches: The embankment is presumed to be constructed of "earth" materials - generally a poorly draining material. The bottom bench is indicated to be pitched inwards on a 20:1 slope and constructed of rock - a highly permeable material. Water will tend to collect at the back of the bench until it soaks into the ground at the base of the embankment. This may reduce the shear strength due to saturation by the water. A forward 20:1 pitch will help minimize this problem and the additional driving forces resulting from the 20:1 inclination can usually be accommodated. THEREFORE it is recommended that the pitch on the bottom bench be reversed from 20:1 inwards to 20:1 outwards.	Agree that internal drainage should be improved as much as practical. We believe there is benefit in pitching the bottom of excavation 20:1 (5%) inward to a pipe in order to intercept groundwater deeper near the core of the slope. When not possible to daylight-drain rock toe, we will indicate that a drainage pipe is to be placed at the base of excavation/rock placement.
5	CO	Daniel Clark	Rock Slope Sliver Fill	Pitch of benches: The benches cut into the embankment are noted to be horizontal. Cutting benches with a dozer is an imprecise art - dare I suggest that the benches are not going to be level when they are done. THEREFORE it is recommended that the benches be deliberately pitched 20:1 <u>outwards</u> like the recommendation for the bottom bench. You want any seepage that may collect along the new-old interface to follow the construction line down and out to a suitable outlet.	Sloping benches at 20:1 may offer a slight benefit to the internal drainage and is a constructable detail. Change incorporated.
6	CO	Daniel Clark	Rock Slope Sliver Fill Note 4	Consider Kentucky Transportation Cabinet classification / test methods for establishing criteria for "durable" rock. See internet links below.	Note 14 has been revised to give clarification to the rock durability.
7	CO	Daniel Clark	Kentucky Geotechnical Manual	http://transportation.ky.gov/Organizational-Resources/Policy%20Manuals%20Library/Geotechnical.pdf	Reference noted. Information similar to what PennDOT has or is developing.
8	CO	Daniel Clark	KY Slake Durability Index	http://transportation.ky.gov/Materials/Documents/KM513_08.pdf	The Department is currently developing PTM testing for rock slaking and also PUB 293 guidance for the assessment of slake durability of rock.
9	CO	Daniel Clark	KY Jar Slake Test	http://transportation.ky.gov/Materials/Documents/KM514_08.pdf	The Department is currently developing PTM testing for rock slaking and also PUB 293 guidance for the assessment of slake durability of rock.

10	CO	Daniel Clark	Rock Slope Sliver Fill Note 7	Replace "manufactured" with "graded".	Note 7 has been removed because the detail does not address slopes steeper than 1.5H:1V.
11	CO	Daniel Clark	Rock Toe Sliver Fill	Pitch of benches: The embankment is presumed to be constructed of "earth" materials - generally a poorly draining material. The bottom bench is indicated to be pitched inwards on a 20:1 slope and constructed of rock - a highly permeable material. Water will tend to collect at the back of the bench until it soaks into the ground at the base of the embankment. This may reduce the shear strength due to saturation by the water. A forward 20:1 pitch will help minimize this problem and the additional driving forces resulting from the 20:1 inclination can usually be accommodated. THEREFORE it is recommended that the pitch on the bottom bench be reversed from 20:1 inwards to 20:1 outwards.	Agree that drainage should be optimized Pitching the slope forward may still allow water to be trapped in the 'bathtub' of the excavation. Sloping inward places the drawdown point at the interior of the fill where it is most critical. Slope is now shown outward, and a drainage pipe is still located at the core of the excavation to help assure good long-term drainage of the rock fill/soil interface.
12	CO	Daniel Clark	Rock Toe Sliver Fill	Pitch of benches: The benches cut into the embankment are noted to be horizontal. Cutting benches with a dozer is an imprecise art - dare I suggest that the benches are not going to be level when they are done. THEREFORE it is recommended that the benches be deliberately pitched 20:1 <u>outwards</u> like the recommendation for the bottom bench. You want any seepage that may collect along the new-old interface to follow the construction line down and out to a suitable outlet. Moreover, 6 to 12 inches of drainage gravel (with or without a drainage geotextile depending on need) placed along this interface would facilitate the internal drainage of any seepage encountered.	Sloping benches at 20:1 may offer a slight benefit to the internal drainage and is a constructable detail. Change incorporated. A drainage pipe is still shown at the interior point of the excavation to allow good drainage of the rock fill.
13	CO	Daniel Clark	Rock Toe Sliver Fill	Consider Kentucky Transportation Cabinet classification / test methods for establishing criteria for "durable" rock. See internet links below.	Agree that a definition of 'durable' would be helpful. We may reference the definitions for durable rock that will be located in the slaking rock assessment chapter of PUB 293 (currently separately under development)
14	CO	Daniel Clark	Rock Toe Sliver Fill	http://transportation.ky.gov/Organizational-Resources/Policy%20Manuals%20Library/Geotechnical.pdf	Reference noted. Information similar to what PennDOT has or is developing.
15	CO	Daniel Clark	Rock Toe Sliver Fill	http://transportation.ky.gov/Materials/Documents/KM513_08.pdf	The Department is currently developing PTM testing for rock slaking and also PUB 293 guidance for the assessment of slake durability of rock.
16	CO	Daniel Clark	Rock Toe Sliver Fill	http://transportation.ky.gov/Materials/Documents/KM514_08.pdf	The Department is currently developing PTM testing for rock slaking and also PUB 293 guidance for the assessment of slake durability of rock.
17	CO	Beverly Miller	Typical All Proposed Standards	Please check with Mark Burkhead regarding format and RC number for the proposed RC standards.	Mark Burkhead has been notified and will be tasked with drafting of the final drawings in the correct RC format. The current drawings are adequate for CT circulation for conceptual and substantive consideration of content.
18	CO	Beverly Miller	Mid Slope Sliver Fill	Please indicate "Not to Scale" as was done for the steep sliver fills standard if this is the case.	Agree. NTS added to each section.
19	CO	Beverly Miller	Mid Slope Sliver Fill	Consider adding a note to embed the toe 2' into the existing ground in addition to what is shown in the detail. Should we say 2' minimum?	The 2-ft. distance indicates where to begin the excavation. That is, 2-ft below the point that the projected "new" slope-line reaches the existing slope. Will clarify drawing.
20	CO	Beverly Miller	Mid Slope Sliver Fill	Please include a legend on the standard so that the conventions for geotextile and existing slope are clear. (The dashed lines look similar.) The use of a legend would also help define graphic symbols, etc.	Will clarify to the extent possible within the line types allowed by the RC drafting standards.
21	CO	Beverly Miller	Mid Slope Sliver Fill	In addition to "Selected Borrow Excavation (206 Rock)" should a note be included referencing Pub. 408 and the 206.2(a).1.d?	Change incorporated.
22	CO	Beverly Miller	Mid Slope Sliver Fill	How does the detail change if a layer of unsuitable material is encountered? Should a note be included to address this?	The excavation would likely be taken deeper in these cases. Problem is addressed on a case-by-case basis for sites where non-stable soils are found during excavation. Notes edited to indicate 2 ft. minimum or to competent soil.
23	CO	Beverly Miller	Mid Slope Sliver Fill	Why isn't the geotextile extended between the Suitable Embankment Material and the Selected Borrow? Would there be potential for migration of material?	Agree. Geotextile will be extend to separate dissimilar materials.
24	CO	Beverly Miller	Mid Slope Sliver Fill	What is the horizontal distance/limitations on the horizontal dimension of the embankment step? Does this need to be included in addition to the 3' rise?	This is notes in the 'Notes'. No change.
25	CO	Beverly Miller	Mid Slope Sliver Fill	For the "panhandle" of the Selected Borrow Excavation (206 Rock), are there any requirements, such as thickness or requirement to cover the horizontal dimension of the first step?	Panhandle removed.

26	CO	Beverly Miller	Mid Slope Sliver Fill	What are the compaction requirements for the sliver fill? The material is specified as conforming to 408 Section 206, but the compaction requirements are not clear.	This is specified in Section 206, based on material type. No change.
27	CO	Beverly Miller	Mid Slope Sliver Fill	Are there any drainage concerns/considerations, such as the potential for trapped/pooling water in the Selected Borrow Excavation at the toe of the slope?	Rock is daylighted and geotextile is placed on upper and lower interface of the layer. Pipe is placed at the interior of the excavation. Rock will be very well drained.
28	CO	Beverly Miller	Mid Slope Sliver Fill	Is there some way to add a detail to address constructability with notes 1 and 2? Note 1 could be interpreted to be in rock, and is top down, while Note 2 could be interpreted to be in soil, which may be more unstable, and would be bottom-up?	Notes 1 and 2 have been removed.
29	CO	Beverly Miller	Mid Slope Sliver Fill	For Note 3 regarding benching quantities paid as Class 1 excavation, do we need to reference Pub. 408 Section 203?	Note 3 had been edited and the reference to Section 203 removed.
30	CO	Beverly Miller	Mid Slope Sliver Fill	For Note 4 recommend providing a separate detail on this sheet rather to avoid confusion.	Note has been removed and all details consolidated to standard.
31	CO	Beverly Miller	Mid Slope Sliver Fill	Would there ever be a need to perform a stability analysis for this detail?	Possibly, depending upon site conditions. Stability analysis requirements will be outlined in the new edition of PUB 293. Various criteria must be considered when determining if a slope needs a formal analysis. Note-1 added to address for all cases.
32	CO	Beverly Miller	Mid Slope Sliver Fill	Is there a maximum slope height for this detail?	No height limit can be stated, but slopes over 20 ft. will likely need a stability analysis performed as-per PUB 293 draft guidelines.
33	CO	Beverly Miller	Mid Slope Sliver Fill	It may be useful (to ensure proper application of the detail) to include a note indicating where this detail is intended to be used.	Note added to explain that this detail will be used when widening embankments that do not require the new slope to extend to the toe of the existing slope.
34	CO	Beverly Miller	Steep Sliver Fills >12'	Is there a maximum slope height for this detail? If so, please address in Note 1.	No height limit can be stated, but slopes over 20 ft. will likely need a stability analysis performed as-per PUB 293 draft guidelines. Note-2 added to detail requiring analysis when H > 20ft.
35	CO	Beverly Miller	Steep Sliver Fills >12'	Recommend adding a note in addition to the detail for the embedment of the tor into the original ground for clarity. Is the 2' a minimum?	Will clarify a 2-ft. minimum. Also clarifying that a minimum of 3 ft. of soil must be removed on all areas of the slope face.
36	CO	Beverly Miller	Steep Sliver Fills >12'	Would there ever be a need to perform a stability analysis for this detail?	Slopes over 20 ft. will need a stability analysis performed as-per PUB 293 draft guidelines.
37	CO	Beverly Miller	Steep Sliver Fills >12'	Please include a legend on the standard so that the conventions for geotextile, and existing road surface, etc., are clear. (The dashed lines look similar.) The use of a legend would also help define graphic symbols, etc.	Agree this needs refined. Final drawings will be performed by Mark Burkhead's Section and will follow the prescribed drafting format for RCs.
38	CO	Beverly Miller	Steep Sliver Fills >12'	On the detail, please specify the rock per 206.1.(a).1.d, currently, only the graphic symbol is shown.	Reference to Sec 206 added.
39	CO	Beverly Miller	Steep Sliver Fills >12'	Are there any drainage concerns/considerations, such as the potential for trapped/pooling water in the rock at the toe of the slope?	Agree that internal drainage should be improved as much as practical. Bottom of excavation is sloped 20:1 (5%) outward and pipe added in order to intercept groundwater deeper near the core of the fill. If not possible to daylight-drain rock toe, pipe is even more important.
40	CO	Beverly Miller	Steep Sliver Fills >12'	How does the detail change if a layer of unsuitable material is encountered? Should a note be included to address this?	The excavation would likely be taken deeper in these cases. Problem is addressed on a case-by-case basis for sites where non-stable soils are found during excavation. No change.
41	CO	Beverly Miller	Steep Sliver Fills >12'	It may be useful (to ensure proper application of the detail) to include a note indicating where this detail is intended to be used.	Note will be added to explain that this detail will be used when widening embankments that does not require slope repair due to slope failure or instability.
42	CO	Beverly Miller	Steep Sliver Fills >12'	What are the compaction requirements for the steep sliver fill? The material is specified as conforming to 408 Section 206, but the compaction requirements are not clear. Is direction for the compaction of the 2A material adjacent to the roadway necessary?	This is specified in Section 206, based on material type. No change.
43	CO	Beverly Miller	Steep Sliver Fills >12'	Note 4 - consider focusing on what is not acceptable; the qualification of a prohibited material rather than indicating what will be acceptable. Section 206.2.(a).1.d specifies that the rock "cannot be excavated without blasting". Is the phrase "it must be blasted" necessary?	This note has been edited.
44	CO	Beverly Miller	Steep Sliver Fills >12'	For Note 7 recommend providing a separate detail and accompanying notes regarding stability analysis, etc., on this sheet (rather than attempt to describe the substitution and steeper slope type), or to limit the scope of standard to the slope of 1:5h:1v max.	This note has been removed.
45	CO	Beverly Miller	Rock Toe	Please indicate "Not to Scale" as was done for the steep sliver fills standard if this is the case.	Agree. NTS added to each section.
46	CO	Beverly Miller	Rock Toe	Consider adding a note to embed the toe 3' into the existing ground in addition to what is shown in the detail. Should we say 3' minimum?	Agree. Will indicate 3 ft. as a <u>minimum</u>

47	CO	Beverly Miller	Rock Toe	Please include a legend on the standard so that the conventions for geotextile and existing slope are clear. (The dashed lines look similar.) The use of a legend would also help define graphic symbols, etc.	Agree this needs refined. Final drawings will be prepared by GF or Mark Burkhead's Section will follow the prescribed drafting format for RCs.
48	CO	Beverly Miller	Rock Toe	Note 4 - consider focusing on what is not acceptable; the qualification of a prohibited material rather than indicating what will be acceptable. Section 206.2.(a).1.d specifies that the rock "cannot be excavated without blasting". Is the phrase "it must be blasted" necessary?	This note has been edited.
49	CO	Beverly Miller	Rock Toe	Are there any drainage concerns/considerations, such as the potential for trapped/pooling water in the rock at the toe of the slope?	Agree that internal drainage should be improved as much as practical. Bottom of excavation is sloped 20:1 (5%) outward and pipe added in order to intercept groundwater deeper near the core of the fill. If not possible to daylight-drain rock toe, pipe is even more important.
50	CO	Beverly Miller	Rock Toe	What material is permitted for the new fill?	Sec 206 modified cited as suitable fill material.
51	CO	Beverly Miller	Rock Toe	The detail is for fills >12' high. Would there be a need to set a maximum/require an analysis at some point? How might the detail change if a layer of unsuitable material/unsuitable material is encountered? Should a note be included to address this?	Guidance will be as stated in new PUB 293 that will require DGE review and stability analysis for slopes >20ft.
52	CO	Beverly Miller	Rock Toe	Expand note 2 to indicate why the DGE is being contacted for new or old slopes exceeding 2:1 - for additional analysis? Consider clarifying that "exceeding" means a steeper slope.	Agree. Reworded.
53	CO	Beverly Miller	Rock Toe	Is sloughing of the new fill slope into the 206 rock a concern? Should the geotextile be extended out in front of the slope to prevent material?	We do not believe this is a concern. No change.
54	CO	Beverly Miller	Rock Toe	In lieu of Note 6, recommend to include another detail to avoid confusion that may result from trying to merge the two details.	Will reword note. In addition, the three details will be placed on one page which will clarify.
55	1-0	Erick Shimko	Note 2	For the Sliver Fill and Rock Toe sheets, Note 2: replace "exceed" with "steeper than" 2:1.	Agree. Reworded.
56	CO	John Hess		See red-lined comments PDF.	Red-lined mark-ups were reviewed and were addressed as appropriate.
57	3-0	Michael Bender	Mid Slope Sliver Fill	Remove references to Selected Borrow Excavation (206 Rock), as Selected Borrow Excavation is in Section 205; change note to reference just some type of rock embankment?	Referencing Sec 206 is understood and accepted practice to define the material type and placement requirements. "Select Borrow Excavation" appears appropriate for calling-out material of specific quality requirements for off-site fill materials, similar to what is stated in Sec 205.1(c).
58	3-0	Michael Bender	Mid Slope Sliver Fill	Should remove the Section numbers from the detail, as the standards would need changed if Pub 408 was updated	Concern noted, but references are believed to be helpful. No change.
59	3-0	Michael Bender	Mid Slope Sliver Fill	Guiderail should be two words	Revised.
60	3-0	Michael Bender	Mid Slope Sliver Fill	Remove (Pub. 408) from note 2).	Note has been deleted.
61	3-0	Michael Bender	Steep Sliver Fills over 12' High	Note 1) is redundant since the Detail is named this.	Revised.
62	3-0	Michael Bender	Steep Sliver Fills over 12' High	Note 3) and 4) should remove the item and section numbers	Revised.
63	3-0	Michael Bender	Steep Sliver Fills over 12' High	Guiderail should be two words	Revised.
64	3-0	Michael Bender	Steep Sliver Fills over 12' High	Fix tabs in Note 6)	Revised.
65	3-0	Michael Bender	Rock Toe	Note 1) is not needed	Revised.
66	3-0	Michael Bender	Rock Toe	Note 3) and 4) should remove the item and section numbers	Revised.
67	3-0	Michael Bender	Rock Toe	Guiderail should be two words	Revised.
68	3-0	Michael Bender	Rock Toe	Fix tabs in Note 6)	Revised.
69	3-0	Michael Bender	Rock Toe	Geotextile should be clearer shown on the detail as it is hard to determine where it is being shown at	Drawing has been refined. Final drawings will follow the prescribed drafting format for RCs.
70	3-0	Michael Bender	All	Format is not correct for an RC; revise accordingly	Drawing has been refined. Final drawings will follow the prescribed drafting format for RCs.
71	3-0	Isaac Bragunier	Steep Sliver Fills	May want to add another label the Geotextile class 4 type A ,under the 2A material at the top of the rock for clarity . Is 2 feet depth deep enough for the guide rail posts?	Agree this is an issue. Drawing will be refined to indicate 3 feet of aggregate below the pavement structure, similar to the PTC drawings.
72	3-0	Isaac Bragunier	General	Is there a detail for sliver fills under 12' high?	Yes. This is now shown on the drawing.

73	3-0	Robert Johnson	General	Is there a minimum existing slope that does not need to have benching used during construction.	Yes. Slopes <12 ft. in height. This is now indicated on the drawing.
74	3-0	Robert Johnson	Mid Slope Detail	Bench should be graded to direct water to daylight	Bench is now sloped outward and geotextile is placed on upper and lower interface of the layer. Pipe is also indicated as added assurance for long-term performance. Rock will drain adequately.
75	3-0	Robert Johnson	General	Most of our widenings are three feet at hinge point to get backup for guiderail, requiring 10' horizontal bench minimum at bottom creates a excessive amount of excavation/fill. Recommend to use a 8' min horizontal width from vertical face of bench to face of final slope	After much consideration, this will be changed to 8 ft. PTC also uses 8 ft. as a minimum. 10 ft is generally better, but agree that site conditions commonly require minimizing the excavation width.
76	3-0	Robert Johnson	General	Recommend to use details similar to PA Turnpike. Attached copy of details.	The PTC detail was reviewed during the development of this CT. Agree that these details are credible and constructable. Aspects of the PTC drawings have been used.
77	9-0	Gloria Collier	Rock Toe	Note 1: Change "old" to "existing"	Revised.
78	9-0	Gloria Collier	Rock Toe	Note 2: I'm a little confused about this note. Is this for when Maintenance is looking for guidance from the District? For a design project we would already have the cross sections which would show the slopes and have already been approved by the District Geotech Engineer.	Yes. Notes revised similar to the PTC directions to have geotechnical review.
79	9-0	Gloria Collier	Rock Toe	Note 3: This may be difficult to identify in the field.	Open voids is a judgement call made by the inspection staff. Can consult the DGE is necessary. General Note "8" instructs to identify "open voids". Open voids in the rock will require geotextile of a choking layer of select granular material.
80	9-0	Gloria Collier	Rock Sliver	Limit size of rock below 2A to R-4 to allow for placement of guiderail Consider a note to choke 206 rock (if needed) before placement of geotextile. Must slope to drain.	Note added similar to PTC that requires top 3 ft. of material below guiderail not to interfere with installation.
81	11-0	Shane Szalankiewicz	General Comment	The intent is to make these drawings into RC's, however, I am concerned with providing these to designers to use without approval from the District Geotechnical Engineer. These drawings should be a starting point and stability should be checked. I recommend making these Geotechnical Design Standards similar to BD's, not RC's.	This is a credible idea, but creating a new publication for these details is beyond the scope of this effort. These RC's will serve as a standard construction guideline, to be refined by design if necessary, according to the anticipated site conditions and approvals needed for use.
82	11-0	Shane Szalankiewicz	Steep Sliver Fills	The title of the detail should indicate for slopes steeper than 2:1, but no steeper than 1.5:1.	1.5:1 is the maximum inclination. Flatter slopes can be constructed of rock if warranted.
83	11-0	Shane Szalankiewicz	General Comment	I do not recommend sloping the toe at 20:1. This leads to a bathtub effect. We do not want water collecting in the toe.	Agree that internal drainage should be improved as much as practical. Bottom of excavation is sloped 20:1 (5%) outward and pipe added in order to intercept groundwater deeper near the core of the fill. If not possible to daylight-drain rock toe, pipe is even more important.
84	11-0	Shane Szalankiewicz	General Comment	The details should provide more information for the shoulder backup. I do not concur with using 2A and prime coat for shoulder backup in high sheet flow conditions. In D-11 we have gotten away from using 2A with prime coat because it eventually breaks down and erodes. The top of our detail is typically AASHTO No 1. Details can be provided if needed.	This a is a good idea, but may be beyond the scope of the current development. Pavement structure is not included. Shoulder back up is somewhat of a 'middle ground' between the benching details and the pavement details. Note that the PTC details include the shoulder backup as part of the slope detail.
85	11-0	Shane Szalankiewicz	General Comment	In line with the previous comment, the top of our benching details in D-11 typical consist of 4' to 5' of AASHTO No.1's. This is particularly important when you have a rock slope. When a 2' shoulder backup is available, a standard guide rail depth is shy of 4'. If you only have 1' of backup, extra long posts are required and the depth of those posts are shy of 5'. You need to be able to drive the guide rail.	Agree this is an issue. New Note 12 indicates 3 feet of aggregate/non-obstructive fill below the pavement structure, similar to the PTC drawings. Also shown on the detail drawing.
86	11-0	Shane Szalankiewicz	General Comment	For 2:1 slopes, we recommend benches to be 6'H min and 3'V max. For 1.5:1 slopes we recommend the benches to be 6'H min and 4'V max.	Both OSHA and the PTC allow a max. bench height of 4 ft. This is also divisible by 6" and 8" lift heights. The 3-ft. bench is not. Revised all bench heights to a 4 ft. max.
87	11-0	Shane Szalankiewicz	General Comment	For the rock slopes, the details call for 206 rock. I assume Districts have their own special provisions for this as this is not an item in the items catalog. There needs to be an item for this. We use a special provision called PTM 510 Rock which is the same as 206 rock, but calls for testing (PTM 510) of the rock. Perhaps in the future, the embankment section can be broken up to separate the rock so standard items can be created.	Rock can be Select R-Rock, or common borrow rock meeting Sec 206. Agree that a Special Provision may need to be used to give a definite criteria for 'durable' rock. PTM 510 is Soundness of Aggregate by Use of Sodium Sulfate which does allow for testing of broken rock pieces such as rock core samples. We may also refer to slaking rock criteria once this issued in Pub 293.
88	11-0	Shane Szalankiewicz	General Comment	Typically here in D-11, we do not have the luxury of projecting our toe out as far as these details show due to ROW concerns. We typically have a vertical cut at the toe and key in a minimum of 3'. Maybe some alternate toe details can be provided for these types of issues.	Site conditions may dictate that the standards may need to be adjusted as you described. Adjustments to the standard to be done with the approval of the geotechnical engineer. Fore-slope of the toe excavation is not a safety concern, so will indicate that the 2 or 3 ft. toe excavation may be cut vertically.

End