CHAPTER 13

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1996 AASHTO Roadside Design Guide
Guide to Management of Roadside Trees in Michigan - MDOT
Standard Plan R-96-Series

13.02 CLEARING

13.02.01 General

All wooded and brushy areas, individual trees, and rows of trees within construction limits should be set up for clearing or removing trees. The Standard Specifications state that the clearing limits shall be 1 m outside the grading limits. For design purposes, it has been determined that clearing should be figured to 1.5 m outside the slope-stake line. Contact the Roadside Development Unit for limits of clearing in parks, rest areas and other environmentally sensitive areas.

Clearing should generally be measured by the square meter. The measurement of clearing by the meter should be avoided because of possible confusion as to what vegetation is to be removed. It is intended that clearing measured by the meter will only be used for long narrow strips of brush, such as along fence rows or in other similar conditions. If clearing by stations is used, a special provision is required. See Section 13.02.06, Clearing for Fence.

13.02.02 Clearing in Water Storage and Wetland Mitigation Areas

Generally, vegetation in stormwater storage areas should be removed if the area will have standing water from a few days to possibly a month. This needs to be done since the trees, if left in place, may die as a result of being in standing water. Consult the District Resource Specialist to determine if any vegetation should remain in place.

Clearing for wetland mitigation areas should be discussed with the Design Division’s Environmental Specialist and with the District Resource Specialist. The clearing limits can then be determined.

13.02.03 Clearing for Vision on Horizontal Curves

The quantity for clearing in clear vision areas should be shown separately and the limits indicated on the plans as “Clearing for Clear Vision.” The quantity for clearing in clear vision areas may be included in the clearing quantity or considered included in other pay items. Horizontal sight distance should be examined throughout the project including horizontal curves, intersections, and clear vision corners.

See Section 3.03.01D for sight distance considerations.
13.02.04

Clearing - Disposition of Timber

The Specifications provide various methods of disposing of merchantable timber depending on ownership and type of right-of-way. These are summarized below:

A. National Forest Land

Merchantable timber is the property of the Forest Service and shall be cut and disposed of as agreed to between the Engineer and the Forest Service.

B. State Forest Land

Merchantable timber will become the property of the contractor and shall be salvaged and made available to wood-using industries or individuals.

C. Private Land

1. Right-of-way easements - Merchantable timber shall be cut and piled outside the right-of-way for the abutting property owner except where the contractor files with the Department an agreement from the owner that he does not desire the salvaged timber. The merchantable timber then becomes the property of the contractor and shall be salvaged and made available to wood-using industries or individuals.

2. Right-of-way fee simple - Merchantable timber becomes the property of the contractor and shall be salvaged and made available to wood-using industries or individuals.

13.02.05

Clearing - Showing on Plans

In preparing plans with the pay item of "Clearing," designers are to be governed by the following instructions:

1. Plans that call for Clearing in National or State Forest areas should show National or State Forest ownership.

2. Clearing quantities should be broken down in area for National Forest, State Forest, or private ownership. This breakdown is for the information of the bidder only. There will be only one bid item for Clearing, which will include the total area shown in the plans.

3. The department attempts to buy all right-of-way that is to be used for highway purposes in fee simple (except for National or State Forest lands). However, there may be cases such as widening jobs on existing right-of-way where easements have been obtained. In such cases, the bidder should know the areas where the easement specification for Clearing applies. Any question relative to whether the right-of-way is easement or fee simple may be referred to the Technical Unit of the Real Estate Division.

4. When surveys provides classification of trees and brush information (see following table), this information should be shown on the plans. This information helps the contractor determine the clearing bid price.
Clearing-Showing on Plans

### CLASSIFICATION OF TREES AND BRUSH

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>CLEARING SIZE</th>
<th>LIGHT</th>
<th>MEDIUM</th>
<th>HEAVY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST CLASS</td>
<td>901 mm DIAMETER OR LARGER</td>
<td>4.5 m OR MORE</td>
<td>3.0 m TO 4.5 m</td>
<td>3.0 m OR LESS</td>
</tr>
<tr>
<td>2ND CLASS</td>
<td>451 mm TO 900 mm DIAMETER</td>
<td>6.0 m OR MORE</td>
<td>6.0 m TO 3.0 m</td>
<td>3.0 m OR LESS</td>
</tr>
<tr>
<td>3RD CLASS</td>
<td>200 mm TO 450 mm DIAMETER</td>
<td>3.0 m OR MORE</td>
<td>3.0 m TO 1.0 m</td>
<td>1.0 m OR LESS</td>
</tr>
<tr>
<td>4TH CLASS</td>
<td>200 mm DIAMETER OR LESS BRUSH</td>
<td>ONE HALF COVERED</td>
<td>TWO THIRDS COVERED</td>
<td>COMPLETELY COVERED</td>
</tr>
</tbody>
</table>

13.02.06

Clearing - Recheck

When more than one year has elapsed between the time of G.I. and the advertising date of a project, it may be necessary to request a field recheck on the clearing limits and classification of the trees and brush.

13.02.07

Clearing for Fence

Clearing for Fence is the removal and disposal of trees, brush, stumps, and other vegetation located along a fence line. It also includes treating the fence line with a material to prevent sprouting of new growth. Maximum width of the clearing zone is 2.5 m within the right-of-way. Measurement for Clearing for Fence will be by length in meters.

13.02.08

Clearing and Removing Trees on Freeway 4R Projects

There are often questions raised as to the limits of tree removal and clearing on freeway resurfacing, rehabilitation, restoration and reconstruction projects. There can also be disagreement in this area among designers, planners, roadside development and the FHWA, especially along the scenic expressways of our state.

The following guidelines were developed for a 1991 resurfacing project on I-75 north of Grayling. These guidelines have the approval of FHWA and concerned Department scenic and environmental specialists.

The designer should develop a special provision based on the following guidelines, and input from the District Resource Person, the Roadside Development Unit, and Traffic and Safety using the following criteria based on existing slopes:
13.02.08 (continued)

**Clearing and Removing Trees on Freeway 4R Projects**

<table>
<thead>
<tr>
<th>Slope</th>
<th>Fill slope</th>
<th>Cut slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:1</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>4:1</td>
<td>12.0</td>
<td>8.0</td>
</tr>
<tr>
<td>5:1</td>
<td>10.5</td>
<td>9.0</td>
</tr>
<tr>
<td>6:1</td>
<td>10.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

These distances are within the range of acceptable clear zone distances given in Table 3.1 of the 1996 AASHTO Roadside Design Guide. Note that the above distances are on the mid to low side of the range of values from the table. Higher values should be considered on the outside of horizontal curves with a radius of 875 m or less or where there is an accident pattern.

Variable slopes should be averaged before applying the above guidelines. Slope averaging applies from the shoulder point out. For example: a 4:1 slope meeting a flat slope for some distance before meeting the tree line would be averaged to something flatter than a 4:1. The following sketch gives an example of slope averaging.

13.02.08 (continued)

Because of the sensitive nature of tree removal, both to the Department and to the public, good information is necessary before the design can be completed. The designer should obtain the following information:

1. Accident history covering at least a three year period.
2. Accurate measurements from the edge of pavement to individual trees and tree lines.
3. An accurate slope survey indicating slopes and changes in slopes from the shoulder point to the trees. This information should be complete enough so that slopes can be averaged.
4. A list of environmental concerns from the District Resources Specialist.

For additional background information the designer should refer to Chapter 3 of this manual and Section 4.8 of the 1996 AASHTO Roadside Design Guide and MDOT’s "Guide to Management of Roadside Trees in Michigan".

13.03 **SELECTIVE THINNING**

13.03.01 **General**

Selective Thinning is the removing and disposing of dead, diseased, poorly formed or undesirable trees outside the normal clearing areas. This item also includes removal of undergrowth, stumps of uprooted trees, and all debris.

The Roadside Development Unit and District Resource Specialist should be consulted when setting up areas for selective thinning.

The Specifications provide for the following types of selective thinning:
13.03.02
Selective Thinning - Type I
This is to be used in areas within the highway right-of-way where a stump not more than 150 mm above ground level may be left in place.

13.03.03
Selective Thinning - Type II
This is to be used in rest area sites and in other areas where it is desirable to have the stump removed to 100 mm below ground level.

13.04
REMOVAL ITEMS

13.04.01
Removals
The extent of removals should be shown or noted on the plans using the conventional "legend sheet" symbols. Any information concerning removals, such as pavement thickness, types, and depth of structures, thickness of bituminous surfacing, etc., should also be shown on the plans. Removal limits, if possible, should be made at existing construction joints of concrete items.

13.04.02
Removing Trees and Stumps
The plans should indicate which trees and stumps will be removed within the right-of-way and outside of areas estimated for clearing. Removing trees and stumps less than 200 mm in diameter will be included in the work of earth excavation. All fruit trees within the right-of-way should be removed.

A. Tree Removal for Completely New Construction for Rural Projects
1. Remove all trees within the established clear zone. See 7.01.11 of this manual.

13.04.02A (continued)
2. Remove all trees less than 15.0 m from the nearest edge of pavement on limited access highways.

B. Tree Removal for Other Roadways:
Tree removal, especially in urban areas and along scenic highways, can be an extremely sensitive item. The designer should use the information available for guidance when setting up tree removal. This information is contained in Section 3.08.03 of this manual.

13.04.03
Removing Culverts and Sewers

A. Removing Pipe Culverts
The removal of driveway and crossroad culverts will be paid for except when the old culvert is being replaced by a new culvert or is in the limits of roadway excavation. If the old culvert is within the excavation limits for the new culvert, its removal will be included in the construction of the new culvert. However, the culvert must still be labeled to be removed. If outside, its removal shall be a pay item. The pay item "Culvert, Remove" will include removing the pipe and any end section treatments.

If the grade of an existing roadway cross-section is changed sufficiently to cause the removal of a pipe culvert in normal grading operations, its removal will be classed as earth excavation and measured and paid for as such.

B. Removing Culverts Other Than Pipe
The pay item of "Culvert, Other Than Pipe, Remove" is for removal of Box and Slab Culverts. Again, if the culvert is to be replaced and the existing culvert is in the excavation limits of the proposed culvert, the removal would be included in the costs of the new structure.
13.04.03B

Removing Culverts and Sewers

If the structure is to be extended or otherwise incorporated in the new work, only a part of the existing structure need be removed to provide a proper connection for the new work.

C. Removing Culvert Ends

It is the intent of the Standard Specifications that "Culvert, Remove End" applies only to pipe culverts and should be used whenever an end section must be removed to extend a culvert or change the end section. Where box or slab culverts are concerned, the pay item of "Culvert, Other Than Pipe, Remove" shall apply. This pay item is used when the entire culvert is to be removed or when just a portion is to be removed. A note describing what is covered will help the contractor to bid the item. The "Culvert, Remove End" item includes the removal of any end treatment regardless of size, including end sections, sloped end sections, and headwalls.

D. Removing Sewers

This item is covered in the Standard Specifications. The provisions are very similar to the culvert removal items. The pay unit for "Sewer, Remove" is in "meter", however, instead of the "each" pay unit used for removing culverts.

E. Salvaged End Sections

End sections to be salvaged and re-used shall be removed without damage and stored outside the construction limits. The designer should consider salvaging end sections if G.I. or other field inspections show ends to be in good condition, but need to be reset because of culvert extensions or other reasons.

13.04.04

Removing Miscellaneous Structures

A. Pay Items

Pay items for removing miscellaneous structures include the following:

- Pavement, Remove
- Curb, Remove
- Gutter, Remove
- Curb and Gutter, Remove
- Sidewalks, Remove
- Masonry and Concrete Structures, Remove
- Basement Cleanout
- Guardrail, Remove Beam
- Track, Unencased Railway, Remove
- Track, Encasement, Remove
- Fence, Remove
- Utility Pole, Remove
- Drainage Structures, Remove
- Drainage Structures, Abandon

B. Removing Pavement

Removal of bituminous pavements and concrete or masonry pavements is covered in the Standard Specifications. The Specifications for bituminous pavements are somewhat confusing as they include both removing pavement and removing bituminous surface items. The table in Section 6.03.04B(6) of this manual shows clearly the proper pay items for different situations.

C. Removing Drainage Structures

Removal of Drainage structures to be replaced within the excavation limits of the new structure will not be paid for separately but will be included in the item of the new drainage structure.

Drainage structures removed within cut sections will not be paid for separately but will be included in the volume paid for as Earth Excavation.
13.05 OTHER COMMONLY USED MISCELLANEOUS ITEMS

13.05.01 Obliterating Roadway

Obliterating Roadway is completely eliminating old roads or temporary roads that are no longer needed. It shall apply only to those portions of the existing or temporary road outside the limits of the new roadway. The old road to be obliterated should be graded and blended into the adjacent terrain. During the grade inspection it should be discussed whether to bury the road surface or remove the road surface. When burying the road is not a viable option, the road surface should be set up for removal and paid for separately before obliteration begins. Ditches should be filled or graded to give a natural appearance. Old Structures should be broken down and buried or removed. The removal of large structures may be paid for separately. Obliterated areas shall be topsoiled, seeded, fertilized and mulched which will be measured and paid for separately. Obliteration may be accomplished by breaking the pavement surface to provide drainage and covering the roadway to a depth of at least 300 mm with suitable material.

13.05.02 Project Cleanup

"Project Cleanup" consists of cleaning up the project, including roadsides, prior to final acceptance. Project Cleanup provides for the removal of all debris, including old fences, fallen timber, logs and rubbish, within the right-of-way up to 15.0 m beyond the grading limits. This work also includes the clean out of all culverts, sewers, and drainage structures installed on the project.

Project Cleanup should be included as a pay item on most projects.

13.05.03 Field Offices and Laboratories

Field Offices and Laboratories are needed on some projects for making field tests and housing office activities. Usually, facilities are available to the Department and the Contractor is not required to furnish a separate field office. The designer should place a note on the GI prints asking if a field office is required.

13.05.04 On the Job Training

The object of On the Job Training is the training and retention of minority and disadvantaged persons on federal-aid projects.

A special provision covers On the Job Training. This item is shown on the note sheet. The Road Design Unit should indicate the number of trainees multiplied by 750 minimum hours per trainee on all qualifying federal-aid projects, including package jobs, as "On the Job Training" ____ hours. The number of trainees should be estimated at one trainee for each complete 1.5 million dollars of contract work.

On package projects, trainees are to be estimated based on the total estimated project construction cost. The quantity, however, should be included with the road construction items, not as a bridge item.
13.05.05
Mobilization

Mobilization is to reimburse the contractor for initial costs incurred prior to starting work on the project. This consists of preparatory work and operations for the movement of personnel, equipment, supplies, and incidental to the project site; for the establishment of the contractor's offices, buildings, and other facilities necessary to undertake the work on the project. It also includes other work and operations that must be performed, or for expenses incurred, prior to beginning work on the various contract items on the project site. This item applies to all projects.

13.05.06
Escalator Clauses - Fuel, Asphalt, Cement, and Steel

When Management determines material price inflation is a concern, it is sometimes desirable for the Department to let contracts with escalator clauses. These escalators allow for adjustments in prices of basic materials that may inflate during the life of the contract. This allows contractors to bid certain items to allow for inflation during the life of the contract.

When management determines that an escalator clause will be used, a special provision will be required setting forth the terms and methods of determining applicable price adjustments.

13.05.07
Erosion Control Items

Soil erosion and sedimentation control is better related to and is covered in more detail in chapter two, Grading and Earthwork. It is included in this chapter since the quantities are generally included under the miscellaneous estimate on the note sheet.

Standard Plan R-96-series lists soil erosion and sedimentation control measures and indicates the areas and conditions where each may be applicable. These control measures are shown on the plans by a circled number corresponding to the key number on the standard plan.

Other items used for soil erosion and sedimentation control are: riprap, seeding, sodding, mulch, slope protection, steel sheet piling, earth excavation, channel excavation, intercepting ditch, paved ditches and pipe culverts. These items are paid for as specified in the standard specifications and are shown in more detail on other standard plans.

The District Soils and Materials Engineer should make recommendations for erosion and sedimentation control measures shortly after the grade inspection. The Roadside Development Section and the District Resource Specialist should also be consulted for both temporary and permanent erosion control work.