

**Forest Service Handbook
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Forest Service Handbook 2409.18 – Timber Sale Preparation Handbook

Chapter 30 – Timber Sale Roads and Sale Project Implementation (Gate 3)

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Superseded Directive: Project Analysis and Design – Gate 2, 2409.18-2002-3.

Approved by: Christopher French, Deputy Chief National Forest System.

Date approved: May 28, 2024

Responsible Staff: Forest Management, Rangelands Management, and Vegetation Ecology (FMRMVE)

Digest: Following is an explanation of the changes throughout the directive by section.

Chapter 30: Restructures chapter. Moves previous direction to chapter 20 of this handbook, except for general financial and economic analysis direction. Moves general financial and economic analysis direction to chapter 10 of this handbook. Incorporates sections previously in sections 42 through 44.2 of this handbook. Makes minor corrections in spelling, punctuation and style practices throughout the chapter. Updates and incorporates additional references throughout. Updates section codes. Clarifies that the gate system is also applicable to stewardship contracting. Substantive changes are as follows:

Section 30.2: Adds a new code and identifies objectives.

Section 30.5: Adds a new code and identifies definitions.

Section 31: Revises caption and incorporates direction previously in section 43 of this handbook. Discusses application of timber sale roads to various contract forms. Provides direction on incorporating timber sale road planning and implementation within Gates 1 through 4.

Section 31.04: Removes code and direction.

Sections 31.2 – 31.5: Revises captions or adds new codes. Incorporates direction previously in sections 43.2 through 43.9 respectively. Incorporates additional references to provide continuity in direction. Incorporates timber sale contract references when appropriate.

Section 31.1: Elaborates further on use of temporary roads relative to the contract and appraisal, including construction, closure and timing of closure.

Section 31.2: Clarifies when it is appropriate to add roads to the transportation system and the use of least-cost road design for building minimum standard roads. Clarifies when it is appropriate to use higher standard road design than necessary to remove timber, and the obligations of the Purchaser and Forest Service toward the total road cost.

Section 31.22b: Updates terminology to Forest Products Financial System (FPFS). Removes discussion on analyzing CWFS-DRES account balance.

Section 31.22c: Updates reference to FPFS. Removes discussion on transferring excess CWFS-DAR deposits.

Section 31.24: Clarifies the difference between “timber sale road construction cost” and “public works construction cost” and application of each.

Section 31.25: Removes direction regarding applying credit to Purchaser’s Statement of Account as specific contract pay items.

Section 31.41: Clarifies that pre-haul maintenance is not to be used in lieu of reconstructing an existing road.

Section 31.42: Clarifies work that is considered maintenance.

Sections 32 – 32.9: Revises captions, removes previous codes, or adds new codes to elaborate on Gate 3 sale preparation activities.

Section 32.3: Incorporates direction previously in section 13.11 of this handbook.

Section 32.31: Incorporates direction previously in section 13.12 of this handbook.

Section 32.71a: Incorporates interim direction.

Section 32.72b: Incorporates direction previously in FSH 2409.12, section 71.4.

Section 33: Revises caption and incorporates direction previously in section 42 of this handbook.

Sections 33.1 – 33.3: Removes previous codes.

Section 34: Revises caption and incorporates direction previously in section 44 of this handbook.

Section 34.1: Adds a new code and incorporates direction previously in section 44.1 of this handbook. Includes additional documentation at gate 3.

Section 34.2: Adds a new code and incorporates material previously in section 44.2 of this handbook.

Sections 35 – 35.3: Removes previous codes.

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30.2 - Objectives

Develop a transportation plan identifying existing, constructed, and temporary roads to harvest timber from sale or stewardship project areas.

Analyze construction and reconstruction road needs.

Determine appropriate use of Deposits for Reconstruction Engineering Services (DRES).

Determine appropriate use of Deposits for Actual Reconstruction (DAR).

Provide direction on the small business road option and contributed funds.

Identify requirement for Purchaser's commensurate share of maintenance for timber removal.

Identify sale implementation activities within Gate 3.

Document necessary information for logical progression in developing a financially efficient timber sale or stewardship project on the ground.

Determine critical and accurate data for preparing the timber sale contract, stewardship contract or stewardship agreement that includes the disposal of timber or forest products in Gate 4.

Prepare sales on the ground in compliance with direction contained in the NEPA decision.

Prepare Timber Sale Summary.

30.5 - Definitions

Allowable Contract Tolerance. The acceptable level of accuracy error identified in the contract and the prospectus to define the area of risk.

Construction Wage Rates. Refer to definition in FSH 7709.56, section 70.5.

Cutting Unit. Refer to definition in section 10.5 of this handbook.

Designation by Description (DxD). Refer to definition in FSM 2440.5.

Designation by Prescription (DxP). Refer to definition in FSM 2440.5.

Discernible boundaries. Refer to definition in FSH 2409.12, section 70.5.

Geo-fence. Refer to definition in FSH 2409.12, section 70.5.

Global Navigation Satellite System (GNSS). Refer to FSH 2409.12, section 50.5.

Global Positioning System (GPS). Refer to FSH 2409.12, section 50.5.

Higher Standard Road. A road with design standards in excess of those needed for the harvest and removal of forest products, such as including surface rock not needed for forest product removal but added to accommodate other commercial or private vehicle use.

Local Woods Wage Rates. Refer to definition in FSH 7709.56, section 70.5.

Payment Unit. Refer to definition in FSH 2409.15, section 60.5.

Premeasurement. Refer to definition of tree measurement in FSH 2409.15, section 40.5.
Synonymous with tree measurement.

Public Works Road Construction Cost. The total cost of constructing all permanent roads specified in the timber sale or stewardship contract, estimated as if construction were to be accomplished by an independent contractor. It includes the additional costs of a public works contract.

Road Construction Cost. The total cost of constructing all permanent roads specified in the timber sale or stewardship contract, estimated as if construction is to be accomplished by the timber Purchaser or stewardship Contractor. The road construction cost is the cost amount used in timber appraisal calculations.

Scaled. Refer to definition of scale sale in FSH 2409.15, section 40.5.

Subdivision. Refer to definition in section 10.5 of this handbook.

Timber Sale Account. Refer to definition of scale sale in FSH 2409.15, section 0.5.

Tree Measurement. Synonymous with premeasurement.

Virtual Boundary. Refer to definition in FSH 2409.12, section 70.5.

31 - Timber Sale Roads

See FSM 2432.34 and 7700 for principal direction on road policies as applied to timber sales or stewardship projects. Reference to timber sales and Purchasers in section 31 through 31.5 of this handbook are also applicable to stewardship projects and Contractors respectively.

Timber sale contracts and permits may authorize construction and reconstruction of roads as follows:

Contract or Permit Form	Specified Roads	Temporary Roads
FS-2400-0001	No	No
FS-2400-0008	No	No
FS-2400-2	No	No
FS-2400-3S/3T/3P	No	Yes
FS-2400-0004	No	No
FS-2400-6/6T	Yes	Yes
FS-2400-13/13T	Yes	Yes

Note that form FS-2400-0001 may also be referred to as FS-2400-001 or FS-2400-1, form FS-2400-0008 as FS-2400-008 or FS-2400-8, and form FS-2400-0004 as FS-2400-004 or FS-2400-4 in Forest Service directives.

Transportation planning requirements include planning for road needs in Gate 1 prior to the sale. Document needs for National Forest System roads in the transportation atlas. Document existing and proposed National Forest System roads in the timber sale project plan at Gate 1, timber sale project design at Gate 2, and timber sale summary at Gate 3. Also indicate in the timber sale project plan, timber sale project design, and timber sale summary of the amount of construction, reconstruction, and/or temporary roads that will be needed for the timber sale.

31.1 - Temporary Roads

Temporary roads are intended only for the Purchaser's short-term, non-recurrent use for a given timber sale, such as roads used to haul timber from landings to permanent National Forest System roads (FSM 2432.34b). Do not authorize construction of a temporary road to avoid construction of a specified road. The Forest Service and Purchaser must agree upon the location, resource protection requirements, clearing widths, and closure or rehabilitation requirements (2400-6/6T contract provisions B/BT5.1). However, when the need for a temporary road is identified during sale preparation, field verify and document during sale layout at least one suitable location that will form the basis for a cost estimate in the appraisal. Coordinate with engineering and resource specialists (soils scientist, hydrologist, fisheries biologist, and so forth) as needed to address potential location and construction problems. Sometimes this will lead to determining the need for specified road construction. Develop cost estimates for temporary roads with assistance from District or Forest engineering staff using local woods wage rates. Include the costs associated with closure and rehabilitation requirements.

The quantity and length of temporary roads is dependent upon several factors to limit environmental impacts. Typically, an increase in temporary roads reduces skidding distances, although the amount of reduction reaches a threshold. The placement of temporary roads may also be affected by terrain features (such as rock outcrops, slope, and drainages). During the environmental documentation and decision phases of sale preparation, develop a least-cost total of constructing temporary roads with the resulting skidding cost, while addressing the environmental impacts and other factors.

Temporary roads must be closed prior to closure of the timber sale unless they will be needed by the Forest Service for short-term access after the sale for slash disposal, site preparation, reforestation, or other post-harvest activities. The regulations in Title 36, Code of Federal Regulations, section 223.37 (36 CFR 223.37) require temporary roads to be revegetated as soon as practicable but at least within 10 years after termination of the contract. Include an appraisal allowance for temporary roads the Purchaser will be responsible for closing. When temporary roads will be left open to accommodate Forest Service post-harvest activities, the Forest Service assumes the responsibility and associated costs for closing the roads. The benefitting function(s) such as brush disposal (BD) or Knutson-Vandenberg (K-V) bear the costs for the closure work upon completion of those activities (FSH 2409.15, sec. 53). It is appropriate to collect BD deposits for closing temporary roads needed for slash treatment activities, and those costs should be reflected in the appraisal (sec. 42.36d of this handbook). The costs for closing temporary roads needed for work included in the Sale Area Improvement and K-V Collection Plan (K-V plan) will be charged to the benefitting function(s). Refer to section 32.21 for direction pertaining to BD and K-V plans. No appraisal allowances are made for costs included in a K-V plan. Leaving temporary roads open to accomplish K-V work other than required reforestation should be avoided, unless it is certain that those projects will be funded. In stewardship contracts where the Contractor will need to construct temporary roads for both timber removal and to complete service work, include the road closure as a service work item. Do not make a timber appraisal allowance for closing those roads.

31.2 - Specified Roads

See FSM 2432.34a and 7700 for prescribed road locations, standards, and specifications used in a timber sale contract. Refer to 2400-6/6T contract specific conditions A/AT7 and provisions B/BT5.2.

1. Add new roads to the transportation system in accordance with FSM 7703.26. Locate specified roads to serve all the resources involved, facilitate completion of the remainder of the transportation system, fit the terrain, and prevent damage to improvements and resources. FSM 7720 provides direction for design, safety, environmental considerations, and economics in constructing roads. Consistent with the applicable design criteria, design roads to meet the needs of projected traffic at the lowest total transportation cost, including construction and maintenance costs and

costs incurred by traffic using the roads (FSM 7721.13). Pursuant to the Forest Roads and Trails Act of 1964, plan for maximum economy roads needed to meet the resource objectives for the sale (FSM 2432.34a provides direction regarding maximum economy roads).

2. Sometimes a sale contract may require road design standards in excess of the least-cost road needed for the harvest and removal of timber from that sale area. This may be the result of including measures to protect or enhance resource values beyond what is needed to remove timber from the sale area (such as increasing the width and/or applying gravel to accommodate recreation traffic). As provided in 36 CFR 223.38, provision shall be made in the contract to compensate the Purchaser for the additional costs, unless the Purchaser elects Government construction under section 14(i) of the National Forest Management Act of 1976 (NFMA). In those situations, the contract requires the Purchaser to only pay the Purchaser's share of the estimated road construction cost. NFMA also establishes a limit on the standards of roads for which costs are charged against the timber.

The increased cost of constructing a higher standard road may be offset with lower log haul and road maintenance costs. The amount of higher standard road construction cost to include as an appraisal cost in Gate 4 is the estimated amount which results in the lowest total transportation cost of the sale (which includes hauling and maintenance cost savings due to construction of the higher standard road). (FSM 2432.34a also provides direction regarding appraisal costs for higher standard roads.)

When use of a higher standard road does not decrease log haul and maintenance costs by an amount greater than or equal to the increased cost of constructing a higher standard road, do one or more of the following:

1. Verify the need for proposed roads and construction standards by reviewing the land management plan and the transportation atlas.
2. Reconfigure the proposed sale in Gate 2 (chapter 20 of this handbook) to obtain volumes of timber and traffic commensurate with the higher standard road.
3. Finance the construction of the road with appropriated funds.
4. Finance the construction with a combination of an appraisal allowance and other construction funds. This is referred to as supplementation which is different than contributed funds used to reduce an appraisal deficit (sec. 31.25 of this handbook describes use of contributed funds). When supplementing a sale, the prospectus and bid must include special wording to allow both small and large business concerns to elect to have the Forest Service construct the higher standard road (sec. 53.64 of this handbook describes prospectus requirements for supplementation). The Purchaser's

share should exceed 60 percent of the total estimated road construction cost. When the Forest Service offers construction funds to build a higher standard road and Purchaser or Contractor elects to cooperate, C/CT2.215# – Cooperative Construction and C/CT5.241 – Estimated Costs for Cooperative Roads are included in the 2400-6/6T contract.

5. For reconstruction projects, reconstruct the road with Forest Service funds. Require a Deposit for Actual Reconstruction (DAR) for the Purchaser's share of estimated road reconstruction costs. Implementation procedures to include DAR in the contract are located in section 31.22c of this handbook. The amount allowable in the appraisal in Gate 4 is the road reconstruction cost of the road that would result in the lowest total transportation cost for the sale. Use appropriated construction funds to finance the portion of the road above the amount allowed in the appraisal. Limit this option to cases in which the Purchaser's share is less than 30 percent of the total estimated road reconstruction costs.
6. Consider staged construction if the criteria listed in paragraphs 1 through 5 cannot be met. The initial sale may include a seasonal limitation if the road is to be constructed to a low standard. Provide for completion of the construction through subsequent sales or appropriated funds.

31.21 - Construction Standards

A variety of construction standards may apply for the specified roads associated with an individual sale. Design roads to a standard consistent with the intended uses established in Gate 2. Consider safety, cost of transportation, and impacts on the land and resources. Refer to 36 CFR 223.38, FSM 2432.34a, FSM 7710, and FSM 7721 for additional direction on road standards.

31.21a - Landings

Consider log landings as temporary and separate facilities except as noted below. To understand contractual requirements, refer to 2400-6/6T contract provisions B/BT6.422 – Landings and Skid Trails and B/BT6.64 – Landings.

Include log landings as a specified road requirement when they meet all of the following conditions:

1. When constructing the landing and the road simultaneously would reduce cost and soil disturbance;
2. When logging system planning has confirmed the need to locate the landing on the specified location;

3. When the landing lies on or immediately adjacent to the road. The road and landing must result in a contiguous cross-section. To the extent possible, locate landings to coincide with turnouts, borrow areas, and turnarounds; and
4. When the landing area is to remain a permanent part of the road.

31.21b - Bridges and Culverts

Refer to FSM 2432.34a and 7722 for principal direction regarding bridges and culverts. Purchasers may furnish materials and construct bridges and culverts when the sizes and types of structures are reasonable and within the construction capability of prospective purchasers or available subcontractors, and either:

1. The structure is necessary for timber harvesting, and the estimated cost does not exceed the estimated cost to furnish materials, construct, remove, and dispose of a temporary structure of untreated materials; or
2. A temporary structure would not:
 - a. Meet best management practices or other local standards,
 - b. Meet water quality and fish habitat needs or mitigate adverse impacts,
 - c. Permit adequate control of erosion during construction and removal, or
 - d. Meet appropriate safety standards.

Permanent structures may also be constructed on National Forest System roads by purchasers when appropriated funds are used to provide materials or cash payments to cover the difference in estimated costs between a permanent structure and the structure needed for the individual sale. This is referred to as supplementation and described in section 31.2 regarding constructing a higher standard road.

31.22 - Reconstruction

Include road reconstruction necessary to accommodate the traffic generated by an individual timber sale, to provide a facility adequate to accommodate traffic that existed before the sale, and to accommodate future traffic. Finance the cost of the reconstruction attributable to traffic other than that from the timber sale with appropriated funds as discussed in section 31.2 regarding constructing a higher standard road, which may result in DAR (sec. 31.22c of this handbook). See also FSM 2432.34a for principal direction regarding reconstruction.

31.22a - Deposits for Reconstruction

Deposits for reconstruction engineering services (preconstruction and construction engineering) and actual reconstruction may be required of timber purchasers on National Forest System lands (36 CFR 212.5(d)(3)) pursuant to the National Forest Roads and Trails Act of October 13, 1964 (16 U.S.C. 537). Note that the terms “preconstruction engineering” and “construction engineering” describe categories of work within reconstruction engineering services, as described in FSM 7720.31, 7720.32, and 7721.31. The authority for requiring deposits does not apply to new construction, maintenance, or related engineering services.

Reconstruction deposits may be collected, if the following requirements are met:

1. The reconstruction is necessary to accommodate the Purchaser’s use of the road. This requirement is met if the timber sale contract specifies road reconstruction and the reconstruction engineering services are necessary to accomplish the reconstruction, including construction engineering to assure that the contract reconstruction requirements are fulfilled; and
2. A determination, as required by Title 16 of the United States Code (16 U.S.C. 537), is made by the appropriate Line Officer that reconstruction engineering services or actual reconstruction by the timber Purchaser is “not practical.” A determination of “not practical” is met if:
 - a. The potential timber purchasers do not have the employees, consultants, or contractors with the skills, knowledge, or equipment to accomplish the work;
 - b. More than one timber Purchaser is required to do work on the same segment of road during the same period; or
 - c. An analysis shows the potential timber Purchaser’s cost to accomplish the reconstruction engineering services exceeds the Government’s cost to accomplish the same work. In making this analysis, coordinate with potential timber purchasers to obtain information concerning their capability and costs for reconstruction engineering services.

31.22b - Collection and Use of Deposits for Reconstruction Engineering Services (DRES)

1. Deposits may be collected for reconstruction engineering services (DRES) on timber sales that require road reconstruction. Do not require DRES on timber sales that appraise at less than base rates, or if the engineering services are so minor that the cost to make collections would exceed collections. Administrative Forests may pool DRES funds.

2. Base the DRES on an estimate of direct expenses needed to accomplish the work for that sale. Do not include engineering administration or administration support in the DRES estimate. Do not base the estimate on a cost per hundred cubic feet or on Forest or Regional averages for this same type of work. The sample cost estimate worksheet shown in exhibit 01 may be used to summarize the estimates.
3. Collect only for reconstruction engineering services that occur after the National Environmental Policy Act decision for the timber sale project. Do not include costs of reconstruction engineering services that must be performed by the Government, such as transportation planning, preparation of Government cost estimates, preparation of payments, and inspecting and accepting the Purchaser's materials and work. Also, do not include engineering services in support of new construction or maintenance.
4. Include an estimate of the overhead assessment following direction in FSH 1909.13, chapter 40. Obtain the national overhead rate from the Albuquerque Service Center Budget & Finance group.
5. Use 2400-6/6T contract provisions C/CT5.213# – Deposit for Reconstruction Engineering Services for collection of DRES funds. Provide adequate detail to track exactly what the deposit covers and a schedule of dates for completion of Government engineering activities that affect the timber Purchaser's operating plan, such as survey, design, and slope staking.
6. Include DRES as a cost element in the timber sale appraisal in Gate 4. The deposits are included as part of the specified road cost.
7. Deposit DRES collections in the "CWFS-DRES" account established specifically for reconstruction engineering services. Deposits are pooled by administrative unit. Refer to FSH 6509.11g, sec. 71.23 regarding CWFS/CWF2 trust funds.

31.22b - Exhibit 01

Sample Deposit for Reconstruction Engineering Services Cost Estimate Worksheet

PRECONSTRUCTION ENGINEERING: Engineering work and expense of preparing investigations, designs, contract documents, and quantities.

Work Activity	Estimate
1. Transportation planning. (All work in support of NEPA analysis and decision.)	<u>1/</u>
2. Engineering investigations, studies and reports, reconnaissance, and location. (Post-NEPA.)	\$ 1,700
3. Preliminary location surveys.	\$ 3,000
4. Soils, foundations, materials investigations, surveys, and tests.	\$ 1,900
5. Preliminary and final designs.	\$ 2,600
6. Preliminary and final drawings, specifications, and estimates of quantities.	\$ 700
7. Preparation of Government cost estimate.	<u>1/</u>
8. Final location surveys staked on the ground.	\$ 1,100
9. Rights-of-way surveys, plans, and descriptions.	\$ 2,300
10. Other (describe) _____	\$ 0

CONSTRUCTION ENGINEERING: Reconstruction engineering services and expense of setting out, controlling, inspecting, and measuring a National Forest System road development transportation facility.

1. Conducting construction surveys to establish line and grade for the work, to control the work, and to measure quantities.	\$ 1,200
2. Redesigning, adjusting, and changing the plans and specifications to meet encountered conditions.	\$ 700
3. Inspecting and controlling operations for compliance with plans and specifications.	<u>1/</u>
4. Inspecting and testing materials to be installed.	<u>1/</u>
5. Inspecting and measuring completed work.	<u>1/</u>
6. Processing payments and accepting materials and work.	<u>1/</u>
PRECONSTRUCTION AND CONSTRUCTION ENGINEERING SUB-TOTAL	<u>\$15,200</u>
OVERHEAD	<u>\$ 4,400</u>
TOTAL	<u>\$19,600</u>

1/ Do not include entries. The Forest Service must do this work, and therefore, a collection is not appropriate.

31.22c - Collection and Use of Deposits for Actual Reconstruction (DAR)

1. Actual reconstruction that involves a single timber sale is accomplished through specified road requirements of the timber sale contract (contract provisions B/BT5.2).
2. Deposits may be collected for actual reconstruction (DAR) that involves several timber sales. This is sometimes referred to as “merged” funding because the DAR from several sales may be merged to reconstruct a road required for each of the individual timber sales. Advance approval by the Regional Forester is required to implement a “merged” funding strategy to ensure the availability of appropriated road funding in the event that DAR funding is not available from any of the timber sales. Generally, work “merged” from several timber sales is accomplished through a public works construction contract.
3. Deposits for actual reconstruction may be collected for the Purchaser’s share of the total estimated road reconstruction cost for a higher standard road when conditions described in sections 31.2 and 31.22 of this handbook are met.
4. Include an estimate of the administrative overhead assessment in DAR collections. Use the process established for “CWF2 - Other” accounts to estimate overhead assessments (FSH 1909.13, ch. 40).
5. Use FS-2400-6/6T contract provisions C/CT5.214# – Deposit for Actual Reconstruction for collection of DAR funds. Provide adequate detail to track exactly what reconstruction these deposits cover, and a date when the reconstruction will be completed and the roads available for use by the timber Purchaser.
6. Include DAR as a cost estimate in the timber sale appraisal in Gate 4. The deposits are included as part of the specified road cost.
7. Place DAR collections in a separate “CWF2-DAR” account for each specific road reconstruction project having DAR collections. DAR accounts are established at the administrative Forest. Refer to FSH 6509.11g, sec. 71.23 regarding CWFS/CWF2 trust funds.
8. If the actual expenses for overhead, public works contract, overruns, changes, and/or claims attributed to DAR exceed the amount collected, use Forest Road Program (FRP), Salvage Sale Fund (SSF), or other appropriate funds to meet the additional needs.

31.23 - Specifications

Refer to FSM 2432.34a and 7721.14 for principal direction on road design specifications. Use the most current version of the Federal Highway Administration publication “Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects” (FP) and

Forest Service Supplemental Specifications (FSSS) when designing specified roads. Include specifications for construction and reconstruction of roads to provide a safe, usable facility and to minimize impacts on lands and resources at least cost. Refer to 2400-6/6T contract specific conditions A/AT7.

31.24 - Small Business Road Option

The timber sale road construction cost calculation utilizes local woods wage rates, and is the cost used in timber appraisal calculations in Gate 4. The road construction cost is also the basis for determining if the threshold is met to offer the small business road election option (sec. 53.8 of this handbook). When the estimated road construction cost is \$50,000 or more, small businesses may elect to have the Forest Service perform the road construction (36 CFR 223.82 and 36 CFR 223.84). A second cost estimate is required when small business bidders are provided the option to elect Forest Service road construction at time of bid. The second estimate is the public works road construction cost which utilizes construction wage rates. When the bidder elects the Forest Service to perform road construction at time of bid, C/CT2.323 – Construction Clearing, C/CT4.12# – Amount Payable for Timber, and C/CT8.41# – Limitation of Performance by Other than Purchaser are included in the 2400-6/6T contract. The amount of the second estimate is shown in contract provisions C/CT4.12# and is the amount that a small business will be required to pay the Forest Service if the bidder elects the road option. Refer to section 53.63 of this handbook for the Purchaser requirement to pay the amount equal to the estimated public works road construction cost in addition to the price paid for the timber and required deposits. When a Purchaser elects Forest Service road construction, contributed funds (sec. 31.25 of this handbook) are not allowed.

31.25 - Contributed Funds

Careful planning of road construction may avoid deficit sales. Deficit sales are defined as sales where the average indicated advertised rate is less than the average base rate.

The Forest Service may contribute cash and/or materials such as culverts or surfacing to reduce the deficit on a deficit sale. The maximum amount of contribution to plan at the time of sale advertisement is half the difference between base rates and indicated advertised rates, when base rates are the greater of the two. In addition, this maximum amount should not exceed 50 percent of the estimated specified road construction cost. The Forest Service shall decrease the amount of contribution by an amount equal to the bid premium, as bid premium is an indication that the deficit is not as great as the appraisal indicates. The bid premium overrides the need for an equal amount of contribution. When the Forest Service offers to contribute funds, C/CT5.215# – Cooperative Construction and C/CT5.241 – Estimated Costs for Cooperative Roads are included in the 2400-6/6T contract. Forest Service contribution (cash and/or materials) is shown in contract provisions C/CT5.215#.

Contributions may be displayed as a credit to the Purchaser's timber sale account.

31.3 - Use of Existing Roads

A Purchaser may use National Forest System roads when the use does not damage the roads or resources and when safe hauling can result (see 2400-6/6T contract provisions B/BT5.12). Ensure the Purchaser includes a list or a map in the timber sale operating plan showing the specific roads scheduled for use in the Purchaser's operations.

Do not authorize the Purchaser's use of unsafe existing roads, unmaintainable roads, or roads that cannot be restored to a safe and/or maintainable condition. Follow the specific instructions for prohibiting or limiting National Forest timber sale traffic, as stated in FSM 7731, FSH 2409.15, and 2400-6/6T contract provisions C/CT5.12# – Use of Roads by Purchaser.

31.31 - Off-Highway Haul

Use off-highway haul as the basis for road design and appraisal where it occurs as common local practice, where it would enhance safety for other traffic, and where it would result in the lowest transportation costs. Where the use of construction costs to accommodate off-highway trucks applies, reflect the economy of the operation in the haul cost estimates. If part of the haul to market must use a State or county road system, include cost estimates in the appraisal in Gate 4 for reloading and trucking at maximum weights and widths permitted on the State or county road system. Refer to FSM 7731.18 for principal direction regarding off-highway haul.

31.4 - Maintenance of National Forest System Roads by Purchasers

Road maintenance should perpetuate the transportation facility to allow it to serve its intended management purposes and to protect the investment, environment, and adjacent resources; provide for user safety; meet applicable air and water quality standards; and provide for user economy. In preparing the sale package in Gate 4, ensure the appraisal and contract require only the Purchaser's fair share of maintenance. Refer to direction in FSM 7732 for guidance on road maintenance. To understand contractual requirements, refer to 2400-6/6T contract provisions B/BT5.3 and C/CT5.31# – Road Maintenance Requirements.

31.41 - Maintenance versus Construction or Reconstruction

A specified road assumes the status of an existing National Forest System road upon acceptance. Prior to acceptance, consider care and use of specified roads as a construction requirement. Road maintenance work does not begin until after the specified road work has been accepted.

Pre-haul maintenance shall not be used as a substitute for reconstructing an existing transportation system road to its original design standard. If a road no longer conforms to the

original design standard, prepare a reconstruction specified road package. As stated in section 31.42, pre-haul maintenance work must meet the definition of maintenance and consist of low-risk items that are easy to estimate and have little chance of changing. Do not include items, such as culvert or rolling dip installation, that require design standards and installation specifications needing the oversight of an engineering representative.

31.42 - Contract Requirements for Road Maintenance

Include any pre-haul work needed on roads not currently maintained for commercial use (usually roads in maintenance levels 1 and 2) as maintenance requirements in the timber sale contract.

FSM 7732.11 describes planning for road maintenance. Road maintenance specifications (T-specifications) are included in the contract for pre-haul, during haul, and post-haul maintenance work. Be sure the work meets the definition of maintenance and consists of low-risk items that are easy to estimate and have little chance of changing. Examples of road maintenance are brushing, cleaning culverts, and cleaning ditches. Replacing or installing culverts (and other work that requires design standards and installation specifications) is not considered low risk and should be considered reconstruction. Appropriate engineering design mitigates the environmental impact of this type of work. To understand contractual requirements, refer to contract provisions B/BT5.3 and C/CT5.31# – Road Maintenance Requirements.

31.5 - Timber Access Policy

Refer to FSM 2431.8 for direction on timber access. Confirm that roads that are intended to be used to haul logs through non-Forest Service ownership have right-of-way easements consistent with intended use.

32 - Timber Sale Project Implementation - Gate 3

Refer to FSM 2432.3 for principal direction regarding sale implementation. Generally, Gate 3 sale preparation activities do not commence until after the decision document is signed and any litigation has been resolved. Some activities may be conducted prior to the decision being signed (FSM 2432.21a) or when litigation has been filed (FSM 2432.31a). Gate 3 includes several sale preparation activities needed to properly support the appraisal, prepare the contract or agreement, and administer the contract or agreement. These activities should represent the most cost-effective means of implementing the sale or stewardship project design (sec. 14.1 of this handbook discusses procedures for increasing efficiency). Reference to timber sales in sections 32 through 34.2 of this handbook is also applicable to stewardship projects.

Refer to FSH 2409.19, chapter 80 for direction allowing most sale preparation activities under good neighbor authority agreements to be completed using State standards, if approved by the Forest Service. The Forest Service shall review sale preparation work by competent, experienced specialists. The review shall determine that sale preparation followed the sale implementation plan and other resource protection requirements or guidance for sale preparation (FSH 2409.19, section 82.1).

32.1 - Parameters of Sale

32.11 - Contract or Agreement Form

Select the appropriate contract or agreement form to be used considering resource management objectives; authority and policy; cost to prepare and administer; available personnel and skills to prepare and administer; potential for salability to a purchaser or contractor; and any other pertinent factors. Use the decision tools in FSM 2432.32, exhibits 01 and 02 and refer to section 52, exhibit 01 of this handbook to assist in the determination. If stewardship authorities that include the disposal of timber or forest products are an option, refer to FSM 2409.19, section 62.1 for a similar display of the characteristics of other stewardship contract and agreement forms. Under the good neighbor authority with a State, the prepared contract shall be reviewed by a Forest Service timber Contracting Officer and approved by the Line Officer prior to timber sale advertisement to ensure protection of the interests of the United States (FSH 2409.19, sec. 82.2). Requirements within the selected contract or agreement form may be the basis for some sale preparation activity decisions.

32.12 - Confirm Sale Area, Contract Area, or Project Area Boundaries

An environmental document may include multiple projects. Boundaries of the sale areas, contract areas, or project areas must not conflict or overlap due to responsibilities and rights conveyed through the contract or agreement. Timing of projects may also be incremental to allow one project to be completed before another is started. For example, one timber sale may not be feasible until specified road construction is completed on a separate timber sale. Therefore, the boundaries of contracts and agreements should be confirmed prior to developing the logging plan. Section 52.91a of this handbook provides further direction on locating sale area, contract area, or project area boundaries.

32.13 - Urgent Need of Harvesting

The Line Officer with delegated authority in FSM 2404.28 to approve a sale or contract (approving officer) shall decide whether to grant contract term adjustment on other Forest Service sales to the Purchaser who is awarded a sale or contract in urgent need of harvesting. This determination is made in advance and conveyed to the Purchaser through the prospectus as discussed in section 53.20a of this handbook. Indicators of a sale in urgent need of harvesting include, but are not limited to:

1. A large percentage of the volume is dead or dying timber subject to rapid deterioration;
2. Failure to harvest the timber promptly could pose a threat to public safety. For example, removing hazardous trees along roads open to the public; or
3. Failure to harvest the timber promptly could create a threat of insect or disease epidemic to National Forest System lands or other lands or resources.

32.2 - Silvicultural Prescriptions

Silvicultural prescriptions are prepared or reviewed by the certified silviculturist in accordance with direction located in FSM 2470 and the Silvicultural Practices Handbook, FSH 2409.17.

Under the good neighbor authority, the Forest Service shall prepare and/or approve the silvicultural prescription of stands within the project area (FSH 2409.19, sec. 82.1). The description and purpose for the prescription is presented in FSH 2409.17. Management direction within the prescription is extracted from plan components of the land management plan, as well as the environmental document and decision document in Gate 2. The final silvicultural prescription is prepared in Gate 3 based upon the selected alternative in the decision.

32.21 - Preliminary K-V, BD, and SSF Plans

Proposed treatments should be identified, and information compiled, during Gate 3 to develop preliminary K-V, BD, and SSF plans. Although the cost calculations for these activities will not be completed in Gate 3, the aggregation of them will be valuable to transfer knowledge when the cost calculations are completed in Gate 4. The following documents are useful in completing this task:

1. Environmental document,
2. Decision document,
3. Silvicultural prescriptions,
4. Cruise results,
5. Sale Area Improvement and K-V Collection Plan (K-V Plan) (FS-2400-0050A),
6. Brush Disposal Treatment Plan (BD Plan) (FS-2400-62), and
7. Salvage Sale Fund Plan (SSF Plan) (FS-2400-51).

Cultural treatments such as thinning, reforestation, and so forth that have been analyzed in the environmental document and are identified in a silvicultural prescription need to be

incorporated within the K-V plan (including K-V work other than essential reforestation) for the sale area. Other appropriate activities (FSH 2409.19, sec. 13) analyzed in the environmental document may also need to be incorporated within the K-V plan. Refer to direction located in FSH 2409.19, ch. 10 for information regarding K-V plans.

An example of the K-V plan is located in FSH 2409.19, sec. 31.21, exhibit 01. The environmental document and silvicultural prescription will also describe fuels treatments for logging slash to be included in the BD plan. Refer to direction located in FSH 2409.19, ch. 40 for information regarding BD plans. An example of the BD plan is located in FSH 2409.19, sec. 42.21, exhibit 01.

Appropriate collection for the salvage sale fund through the SSF plan is based upon the amount of dead and dying evident in the cruise data. Refer to direction located in FSH 2409.19, ch. 70 for information regarding SSF plans. An example of the SSF plan is located in FSH 2409.19, sec. 73.22, exhibit 01.

32.3 - Financial Efficiency and Salability Review

Procedures for completing this Gate 3 sale preparation activity are provided in chapter 14. Identify individual timber sales, permit areas, or stewardship projects within the project area considered in the timber sale project design prepared at Gate 2. Also follow guidance in FSM 2432.32 regarding financial efficiency analysis review. Note that decisions in each sale preparation activity affect other sale preparation or administration activities. For example, while decisions to use virtual boundaries and designate timber by prescription during sale preparation will eliminate marking costs, they may increase cruising and sale administration costs. Also consider the effect upon salability to potential purchasers or contractors when making sale preparation activity decisions (sec. 13 and 34 of this handbook discusses the requirement to determine salability). Using the previous example, the use of virtual boundaries and designation by prescription (DxP) may increase a Purchaser's costs, affecting both the Purchaser's willingness to bid and the amount bid. In the case of a stewardship contract that includes disposal of timber or forest products, a reduction in the timber bid will reduce the amount of stewardship work that can be performed.

32.31 - Scope of Analysis

At Gate 3, continue analysis of optional implementation methods, such as marking versus designating without marking and different cruising methods, to ensure the project is implemented in the most cost-effective manner practicable. See section 14.1 of this handbook for direction on cost effective methods. Also consider the amount of acceptable risk between optional implementation methods. For example, the reduced sale preparation costs of DxP may increase the cost of sale administration and the risk of the wrong trees being cut, while the increased cost of marking may decrease the cost of sale administration and the risk of the wrong trees being cut. As needed during sale implementation, perform additional analyses for

remaining site-specific options to ensure sale planners and preparers use efficient methods, such as cost-effective cruise designs, designation methods, and road design techniques to accomplish objectives.

32.32 - Displays and Documentation

Append the financial and, if appropriate, economic efficiency analysis results and documentation to the timber sale summary and/or silvicultural prescription as appropriate. Report the results of the Gate 3 financial analysis and, if completed, the economic analysis in a table similar to that displayed in section 23.22, exhibit 01 of this handbook.

32.4 - Resource Surveys

Continue wildlife and other resource surveys to locate species or areas to be protected (Special Measures Area, sec. 52.91, exhibit 04 of this handbook) within the sale area that may not have been documented previously. Additional findings resulting from these surveys are incorporated into the sale preparation process.

32.5 - Logging Plan

The logging plan is developed throughout Gate 3 as more information is obtained within a specific sale area. The following documentation is valuable when preparing the logging plan:

1. Environmental document,
2. Decision document,
3. Silvicultural prescriptions,
4. Transportation plan,
5. Selected contract or agreement form,
6. Location of special measures areas,
7. Topographic map of the sale area, and
8. Remote sensing imagery.

The logging plan consists of both a spatial and narrative depiction of the area. Aspects within a logging plan will vary depending upon features within a particular sale. Generally, a logging plan may be developed as follows:

1. Initially, timber stands proposed for treatment are displayed on a map.

2. Timber stands may be combined within one cutting unit if timber designation and logging methods are the same across the stands and the combination results in logical and greater logging efficiency. Proposed cutting unit boundaries are identified on the map using factors such as stand boundaries, prescriptions, slope, physical barriers, streams, and logging method.
3. Cutting units may be combined into subdivisions (for scaled contracts) or payment units (for premeasurement contracts). Consider contract specifications and Purchaser's or Contractor's contract responsibilities when determining boundaries of subdivisions or payment units. To facilitate sale scheduling, payment units should be no larger than the amount of timber expected to be cut in 60 days (sec. 52.91b of this handbook). Due to contractual obligations, every acre of the sale or contract area should be included within one of the subdivisions or payment units. Review the contract or agreement form to understand implications of locating subdivision and payment unit boundaries.
4. The transportation system displayed in the logging plan must consider all aspects of transporting logs from the stump to the point of manufacture, including any findings from the transportation plan. Consider limitations on the type and physical capability of equipment that is available to harvest and transport timber from the area. Considering the proper equipment, depict a viable skid pattern with potential skid trail locations that lead to landings suitably located and sized for the quantity of logs being serviced. Possible temporary road locations should be considered which lead to useable haul roads. The logging plan must display the expected skid pattern, landing locations, temporary roads, constructed haul roads, and existing haul roads. Discuss how the selected transportation system is the most efficient means of transporting the timber from the sale area.
5. Cultural resources, improvements to protect, and other protected areas must also be identified. The sale contract defines an area to be protected as a special measures area (SMA). Discuss what contract or agreement language will be incorporated to protect these resources or areas (by contract or agreement reference citation).
6. Methods of brush disposal should also be identified in the logging plan, including what measures will be incorporated within the contract or agreement (by contract or agreement reference citation).

As sale preparation activities become more complete, the final features on the logging plan will stabilize. The final version of the logging plan will provide information for the timber sale summary, appraisal, and sample contract.

32.51 - Timber Sale Roads

Based on the environmental document and decision, prepare a list of roads needed to harvest the timber. Refer to section 31 of this handbook for direction regarding permanent and temporary roads. Individuals from engineering and forest management with expertise in sale preparation, administration, and/or logging systems should continue coordinating efforts initiated in Gate 1 (section 21.24 of this handbook) to ensure roads are in the proper location for current and future needs and can be built to standards that will support logging traffic. Flagging, or otherwise identifying new road locations, on the ground would facilitate specified road construction requirement discussions in a subsequent “plan-in-hand” review (sec. 32.51a of this handbook). If roads will be built to a higher standard than needed for the sale, verify that supplemental funds will be available to offset the additional cost as described in section 31.2 of this handbook. Section 21.24 of this handbook describes the analysis necessary in Gate 1 to determine the most cost-effective haul route. Verify that the analyzed haul route continues to be the most cost-effective. As stated in section 21.24, a longer haul route may be a less expensive route when road maintenance costs and class of roads are considered. Roads proposed to be used to haul logs should be driven or walked to identify potential problems using them as intended and to reduce potential for unforeseen design issues or costs. Identify existing roads that can be used without reconstruction, existing roads to be reconstructed through the contract or agreement, and new roads to be constructed through the contract. This information will be useful in preparing 2400-6/6T contract specific conditions A/AT7. Confirm that roads that are intended to be used to haul logs through non-Forest Service ownership have right-of-way easements consistent with intended use. Determine any operating or hauling restrictions that apply to the roads and bridges. This information will be useful in preparing 2400-6/6T contract provisions C/CT5.12# – Use of Roads by Purchaser. Also determine any maintenance needs, whether pre-haul, during haul, or post-haul. This information will be useful in preparing 2400-6/6T contract provisions C/CT5.31# – Road Maintenance Requirements.

32.51a - Specified Road Survey and Design

Specified road survey and design is undertaken by engineering in consultation with a forester with expertise in sale preparation, administration, or logging systems. Roads needing construction or reconstruction within the environmental document are surveyed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources (36 CFR 223.38; FSM 2432.34, para. 4; FSM 2434; and sec. 31 of this handbook). Appropriate and sufficient data is collected in Gate 3 to prepare drawings for a specified road package in Gate 4 in accordance with direction located in FSM 2432.34a and sections 31.2 and 31.21 of this handbook for the prescribed road locations, standards, and specifications used in the contract. The specified road package in Gate 4 will include the:

1. Design package,

2. Specified road cost and engineer's estimate for construction and reconstruction,
3. Applicable contract provisions,
4. Applicable DRES, and
5. Applicable DAR.

Conduct a “plan-in-hand” field review of any new construction with the Forest Engineer, District Ranger, Contracting Officer, and any specialists deemed appropriate by that team such as a soils scientist, hydrologist, or fisheries biologist. Depending on the scope of reconstruction, a plan-in-hand review of reconstruction work may also be appropriate. Field review the final road locations, restrictions, and design standards to ensure they address resource protection measures, access the cutting units per locations in the logging plan, and meet current and future needs for timber removal. The field review should help to prevent unexpected problems that could result in a claim or require an expensive contract modification to resolve.

32.52 - Average Skid Distance

Many appraisal systems incorporate average skid distance. As discussed in section 31.1, the skid distance is determined through an analysis of the least-cost total of constructing temporary roads versus the resulting skidding cost, while addressing the environmental impacts and other factors. Use the logging plan to calculate the average skid distance by weighting the amount of volume arriving at each of the landings. Consider that volume is being collected at different points along the skid trail, or that volume may not be collected on the portion of a skid trail outside the cutting unit. A reasonable average skid distance may be obtained through logical calculations. However, computer programs are also available that require more intensive data. Document calculations and premises used to determine average skid distance.

32.53 - Average Haul Distance

Many appraisal systems incorporate average haul distance. Haul distance is determined by the haul route that was developed in Gate 1 (section 21.24 of this handbook) and verified in the logging plan transportation analysis (section 32.51 of this handbook). Use the logging plan to calculate the average haul distance by weighting the amount of volume being transported from each of the landings. Consider that volume is being collected at different points along the road system until the volume leaves the sale area. A reasonable average haul distance may be obtained through logical calculations. However, computer programs are also available that require more intensive data. Document calculations and premises used to determine average haul distance.

32.6 - Layout

Layout transfers the stand boundaries from the logging plan onto the ground. The following items and documents are useful in completing this task:

1. Logging plan,
2. Silvicultural prescriptions,
3. Plastic flagging,
4. Compass and tape or laser rangefinder,
5. Global Navigation Satellite System (GNSS) receiver and surveying software,
6. Clinometer or hypsometer,
7. Topographic map of the sale area, and
8. Remote sensing imagery.

Plastic flagging can be used to initially identify cutting unit boundaries and other features such as proposed roads on the ground. Flagging allows locations to be easily adjusted before final locations are identified with paint or other means.

As stated in section 32.5 of this handbook, timber stands may be combined within one cutting unit if timber designation and logging methods are the same across the stands and the combination results in logical and greater logging efficiency. While locating cutting unit boundaries, the interior of the cutting units should be examined for unforeseen circumstances which may preclude or modify the ability to harvest the cutting unit. Examples may include such features as cliffs, slides or slumps, unsuitable soil conditions, suitability of timber, threatened and endangered (T&E) species nest tree, or other resource concerns. Boundaries may need to be modified or the cutting unit eliminated after evaluating internal features. If this occurs, the logging plan will need to be updated to reflect the change.

When stands are identified for treatment, do not modify the cutting unit boundaries to omit a portion of the stand based on its proximity to non-National Forest System lands. As discussed in section 32.62 of this handbook, management activities shall use and occupy the land and resources of the United States up to the property line to prevent the creation of a false or misleading use line.

32.61 - Remote Sensing, Maps, or Other Field Imagery

This information is fundamental to understanding how the sale preparation activities were implemented on the ground by field personnel; and is therefore valuable for knowledge transfer to sale administration staff. Retain in the official project files all remote sensing, maps, photos, and images used by field personnel in preparing the timber sale, stewardship contract, or stewardship agreement.

32.62 - Land Line Location

FSM 7152.03 states that all National Forest System property boundary lines adjoining private, State, and public trust lands, such as Indian Reservations, shall be located, monumented, marked, and posted to prescribed Forest Service standards prior to undertaking land management activities that will occur near or adjacent to the property line. All land management practices shall use, occupy, and/or protect the land and resources of the United States up to the property line to prevent the creation of a false or misleading use line. FSH 5609.11, sec. 30.3 further requires land lines to be surveyed, located, monumented, marked, and maintained to Forest Service standards prior to undertaking land management activities that will occur within one-quarter (0.25) mile of any National Forest System boundary line.

Cutting unit boundaries within 0.25 miles of other land ownership, wilderness areas, or other protected areas must be located and posted on the ground when management activities will occur adjacent to these lands. Consult with Lands Boundary Management personnel to determine the land line survey needs. Virtual boundaries are not allowed when boundaries abut these land ownerships as shown in section 32.71b of this handbook. Corner survey markers, section corners, witness trees, and other survey monuments must be protected. Witness trees must be marked for protection as discussed in FSH 2409.12, section 71.5 and section 32.72a of this handbook. Contract provisions B/BT6.23 – Protection of Land Survey Monuments require Forest Service posting identifying signs on two sides of each known bearing tree. Also, the Purchaser is required under B/BT6.23 to protect all known survey monuments, witness corners, reference monuments, and bearing trees against avoidable destruction, obliteration, or damage during Purchaser's operations. Monuments shown on an atlas as being previously located must be visited during sale layout to ensure they are identified as described in the timber sale contract. Failure to comply with this requirement compromises the Forest Service's ability to enforce the contract provisions. These activities are to prevent incursion of logging activity onto neighboring property and protect survey features. Therefore, it is important to identify and properly post these locations during presale activities. The following documentation is valuable when locating land lines:

1. Plat maps showing private or other government land ownership,
2. Monumentation documentation,

3. Wilderness boundary maps,
4. Other protected resource area maps,
5. Topographic map of the sale area, and
6. Remote sensing imagery.

32.63 - Skyline or Aerial Logging

Prepare ground profiles, locate corridor limits, and designate spar trees and tail holds to be used if skyline operations are required within the contract. Locate helicopter landing sites to be used when aerial operations are required within the contract.

32.64 - Harvest Layout Notes

Harvest layout notes for a cutting unit can be prepared, in digital or printed format, describing cutting unit number, brush requirements, special resource protection requirements, type and color of tree mark (or other designation without marking), stand prescriptions included within the cutting unit, and cultural treatments. Also include a map displaying the cutting unit with projected skid pattern and landing locations and projected temporary road locations. Although the format of the information may vary, the site-specific information is necessary for the transfer of knowledge between timber sale preparation and administration personnel. Harvest layout notes depict similar information as that contained in the logging plan, except on the scale of a cutting unit rather than the entire sale and with “ground truthing” that occurs during layout. Exhibit 01 provides a sample of information that could be included within harvest layout notes.

The following documentation is valuable when preparing harvest layout notes:

1. Logging plan;
2. Silvicultural prescriptions;
3. Topographic layout map showing cutting unit boundaries, sale area boundary, and subdivision or payment unit boundaries; and
4. Marking guides (including determination of wildlife trees and protected areas).

32.64 - Exhibit 01

Sample Logging Systems Recon & Sale Unit Layout Field Notes

Project/Sale Name and Number _____

Date (mm/dd/yyyy)

Harvest Unit # _____

Estimated Acres _____

GPS File Name/Date/Personnel _____

Boundary Designation/Paint Batch _____

Timber Designation/Paint Batch _____

A. IMPROVEMENTS:

Survey Monuments _____

Powerlines _____

Other _____

Roads:

Specified Reconstruction _____

Length _____

Specified Construction _____

Length _____

Temporary _____

Length _____

Existing Non-system _____

Length _____

B. RESOURCES:

Streams _____ Location _____

Springs _____ Location _____

Nests _____ Location _____

Heritage _____

Other _____ Location _____

C. LOGGING METHOD:

Whole Tree Yarding _____ % for this system _____

Forwarder/Cut-to-Length _____ % for this system _____

Skyline _____ % for this system _____

Helicopter _____ % for this system _____

Logging System Specifics –

Percentage Uphill _____

Percentage Downhill _____

Average Slope _____

Maximum Yarding Distance _____

Average Yarding Distance _____

Landings _____

Directional Falling _____

32.64 - Exhibit 01--Continued

Sample Logging Systems Recon & Sale Unit Layout Field Notes

D. COMMENTS:

E. MAP:

Township _____
Range _____
Section(s) _____

LEGEND

(Include appropriate map features such as: unit boundary; yarding boundary; yarding direction; proposed log landing location; existing, constructed, and temporary roads; logging system; surface water; streams; slash requirements; and so forth. Use map symbols, as appropriate, from section 52.91, exhibit 04 of this handbook.)

PREPARED BY _____
Date _____

32.7 - Designating Boundaries and Timber

The boundaries of cutting units, payment units or subdivisions, sale area, and other features and the designation of timber must be done using methods described in the timber sale contract, stewardship contract, or stewardship agreement. The term “marked” is defined in the contract as trees individually designated by the Forest Service with paint marks above and below stump height. FSH 2409.12, ch. 70 provides procedures to meet this contractual requirement. Boundaries and trees can also be designated by methods that do not require individual trees to be marked. The following sections describe methods addressed in contracts and agreements for designating boundaries and included timber with and without marking.

32.71 - Boundary Marking and Delineation

Boundaries are ready to be delineated on the ground after the layout person has finalized the location of the cutting unit boundaries, sale area boundary, and subdivision or payment unit boundaries. Refer to section 52.91b for additional direction regarding placement of subdivision and payment unit boundaries. The following items and documents are useful in completing this task:

1. Topographic layout map showing cutting unit boundaries, sale area boundary, and subdivision or payment unit boundaries;
2. Remote sensing imagery;
3. Tracer paint;
4. Global Navigation Satellite System (GNSS) receiver and surveying software;
5. Paper or plastic sale area boundary signs;
6. Paper or plastic subdivision or payment unit boundary signs; and
7. Paper or plastic cutting unit boundary signs.

Boundaries define where timber harvesting or other resource management activities are to take place. It is important to identify boundaries in such a way that the Purchaser or Contractor knows their exact location within the sale area to prevent misunderstanding and misinterpretation.

32.71a - Boundary Marking

Refer to FSH 2409.12, sec. 71.22 for boundary marking direction. The timber sale contract requires that the cutting unit boundary locations must be clearly identified by painting the boundary, unless virtual boundaries are utilized (see section 32.71b of this handbook for virtual boundary criteria). Paper or plastic signs may be used in addition to using painted (or virtual) boundary identifications, as needed, to identify the cutting units, payment units, and sale area boundaries. Signs are for the sole purpose of facilitating identification, not for contractually delineating the boundary. Retain a record of paint swatches, color, brand, batch number, and test results used on the boundaries for sale administration.

32.71b - Virtual Boundaries

Reference the Virtual Boundary Desk Guide for field guidance on implementing virtual boundaries. Also refer to FSH 2409.12, sec. 71.22 for information regarding designation without paint. Virtual boundaries are considered clearly identified cutting unit boundaries that are unpainted or otherwise unmarked. As with painted boundaries, paper or plastic signs may be used, as needed, to identify the cutting units, payment units, and sale area boundaries in addition to the virtual boundary designation. A special contract provision must be included within the contract in accordance with the contract provision instructions to implement virtual boundaries. There are two types of virtual boundaries — discernable and geo-fence (FSH 2409.12, sec. 70.5).

A geo-fence is an exact line that accurately describes the cutting unit boundary. Because Global Positioning System (GPS) and georeferenced maps and photos contain some level of accuracy error, the geo-fence will also have that same level of error associated with it. The National Technology and Development Center (NTDC) maintains a list of GPS receiver horizontal accuracy reports by device and canopy densities that should be used when determining the geo-fence accuracy. Refer to FSH 2409.12, chapter 50 regarding use of the GPS accuracy matrix. For geo-referenced maps and photos, the process is more complicated and may require the collection of ground control points to determine the error if the error information is not available.

Any sale or acquisition of services must conform to the terms of the contract, including what is being sold and where that material is located. The sale includes forest products and acquires services only within the contract area described in the contract. Because a GPS receiver is required to locate the boundary, the contract will need provisions to describe the accuracies of the GPS receiver and software to be used. The approved final geo-fence digital vector file/shapefile used for marking and cruising shall need to be provided to the Purchaser and sale administrator for locating the boundaries. The digital locations on this vector file are considered the true boundary line. When using geo-fencing, the special contract provision shall identify the allowable contract tolerance, specify required accuracy of the GPS receiver

based on the NTDC horizontal line accuracy matrix, and describe the vector file which specifies the location for the contract. Follow the procedures for creating the digital vector files as defined in FSH 2409.12, sec. 53.

Before utilizing virtual boundaries, a risk assessment must be completed for boundaries that will be designated without paint. The risk assessment must be incorporated within the financial analysis (sec. 32.3 of this handbook). The Virtual Boundary Desk Guide displays a risk assessment example. Document all possibilities of boundary lines that are being assessed in the risk assessment.

For geo-fencing, the risk assessment will identify the boundary line location, the methodology used to create the geo-fence (outlined in FSH 2409.12, ch. 50), the type of equipment to be used in monitoring the implementation of the geo-fence, the expected type and magnitude of error, and the rationale for applying a geo-fence (for example time and cost savings, low risk to resource, and so forth). The completed risk assessment requires concurrence by the Contracting Officer and approval by the District Ranger. In addition, law enforcement should also be consulted regarding external boundaries.

Although geo-fencing cannot be used to delineate boundaries that abut other land ownership as discussed in FSH 2409.12, sec. 71.22, geo-fencing may be used within 0.25 miles of other land ownership. Utilize the actual area of risk described in the Virtual Boundary Desk Guide as the cutting unit boundary location when assessing the 0.25-mile criterion.

32.72 - Marking or Otherwise Designating Timber

Direction for preparing marking guides, marking or otherwise designating timber, identifying special reserve trees, and using tracer paint is located in FSM 2441 and FSH 2409.12, ch. 70. Under the good neighbor authority, the Forest Service shall prepare and/or approve the marking guides for the project (FSH 2409.19, sec. 82.1). The following items and documents are useful in completing this task:

1. Topographic layout map showing cutting unit boundaries, sale area boundary, and subdivision or payment unit boundaries;
2. Marking guides (including determination of wildlife trees and protected areas);
3. Tracer paint (if marking with paint); and
4. Remote sensing imagery (as needed).

Ensure the timber to be removed or protected is identified clearly on the ground through marking or description and can be easily described in the contract or agreement requirements. Also ensure timber can be removed with the least damage to the residual stand. It is important

that the requirements in the environmental document are translated accurately through the marking guides and designation into the contract or agreement in such a way that the Purchaser or Contractor understands the requirements.

32.72a - Individual Tree Marking

Direction for preparing marking guides, marking timber, and using tracer paint is located in FSM 2441 and FSH 2409.12, ch. 70. Retain a record of marking checks; paint swatches, color, brand, and batch number; and test results used on the cutting units for sale administration.

32.72b - Designating Witness and Reserve Trees

Refer to FSH 2409.12, section 71.5 for direction regarding marking witness and reserve trees for special purposes. These trees must be leave tree marked in a unique manner from surrounding trees to draw attention to their protection. In addition to marking, signs must be posted on two sides of witness trees and may be posted on other reserve trees to facilitate identification. To understand the contractual obligations relative to witness trees, refer to contract provisions B/BT 6.23 – Protection of Land Survey Monuments and FSH 2409.15, ch. 60. To understand the contractual obligations relative to reserve trees, refer to contract provisions C/CT 2.3# – Reserve Trees and C/CT 6.32# – Protection of Reserve Trees; and FSH 2409.15, ch. 20.

32.72c - Designating Without Marking Individual Trees

Refer to FSM 2441.2 when considering area designation to reduce sale layout costs. Use clearcut units, overstory removal units, understory removal units, and designation of trees by description (DxD) or designation of trees by prescription (DxP) as treatment designations to reduce sale layout costs when such methods would accomplish the sale objectives.

1. Clearcutting, overstory removal, and understory removal are forms of DxD addressed in standard contract provisions. Refer to standard contract provisions B/BT2.31 – Clearcutting Units, B/BT2.33 – Overstory Removal Units, and B/BT2.34 – Understory Removal Units for application of these methods.
2. In addition to the DxD methods described in paragraph number 1 above, DxD may be accomplished using four national special contract provisions approved by the Washington Office, Director, Forest Management. Only national special contract provisions for forms FS-2400-6/6T and FS-2400-13/13T are authorized for use with DxD. Trees are designated to be cut or left uncut by describing measurable characteristics of individual trees and/or their juxtaposition to each other. Care should be taken when using DxD on stands that are in transition from live to dead, particularly on tree measurement contracts where the volume is cruised prior to award. Further information regarding implementation of DxD provisions can be found at FSH 2409.15, ch. 20. The approved national special provisions include:

- a. C/CT2.351# – Designation by Spacing,
 - b. C/CT2.352# – Designation by Species and Diameter,
 - c. C/CT2.353# – Designation by Damage Class, and
 - d. C/CT2.354# – Designation by Row Spacing.
3. DxP may be accomplished by prescribing the desired composition of the cutting unit following harvesting within a national special contract provision approved by the Washington Office, Director, Forest Management. Only the national special contract provisions for form FS-2400-6 and FS-2400-13 are authorized for use with DxP. The Purchaser has discretion within the guidelines of the prescription in selecting which trees to cut and leave. As a result of the inability to ascertain the actual trees the Purchaser will harvest, the volume cannot be quantified for payment purposes using premeasured contracts. Therefore, DxP is not authorized for use on premeasurement contracts (FSM 2441.03). Consider using DxP as an alternative to designation by damage class in situations where it will be difficult to look at individual stumps to determine if the tree was authorized to be cut or not. A determination of whether the correct trees were cut or left is done at the cutting unit level. Refer to FSH 2409.15, ch. 20 and contract provision C2.355# – Designation by Prescription.
 4. Clearly identify the cutting unit boundaries (FSH 2409.12, sec. 71.22).
 5. Ensure the sale or contract area map agrees with the designated boundaries on the ground.

32.73 - Mark Right-of-way/Road Clearing Limits for Specified Roads

Delineate the specified road clearing limit boundaries on the ground. Because of the way volume and payments are addressed in tree measurement contracts, right-of-way volume must be included in one or more payment units that are comprised of only the right-of-way timber. Where specified roads pass through cutting units, the right-of-way volume must be associated with the specified road payment unit and not the cutting unit. On scaled sales, the right-of-way timber should be included in one or more cutting units. It is not necessary to create a separate subdivision for the right-of-way timber but use care to not double count volume where specified roads pass through cutting units. The road right-of-way timber will be cut as a part of the road construction/reconstruction activities. Following these procedures will facilitate release for cutting, payment for the timber, and acceptance of work.

32.8 - Area Determination

Methods, requirements, policy, and error standards regarding area determination of cutting units are located in FSH 2409.12, ch. 50. Area determination is critical for area-based cruises and for completing contract or agreement information for conditions similar to FS-2400-6T, AT4.

32.9 - Volume Determination

Design and implement a cruise that accurately estimates volume in an efficient and economical manner utilizing certified cruisers, while meeting appropriate error standards. Direction for this activity is located in FSM 2442 and FSH 2409.12. Retain records of the cruise plan, cruise output, and Line Officer certification, including a volume summary for each cutting unit and payment unit. Include volume for timber within specified roads in the volume summary as one or more payment units for tree measurement contracts. Volume does not need to be calculated and identified separately within scaled contracts, since volume is not tracked by individual units. The final cruise volume, appraisal volume, and contract or agreement volume must be equal. Refer to FS-2400-6/6T contract provisions B/BT2.4 for understanding regarding contract volume. Ensure the final cruise plan, final cruise, and certification are clearly identified as final in the official sale file as stated in FSM 2442.3. Also include the results of the check cruise if one was conducted. Group species with the same utilization standards, as appropriate. If a contract is prepared using a weight factor, document how the weight factor was determined if predetermined weight factors within the National Cruise Program were not used. FSH 2409.12, ch. 80 provides direction regarding calculating weight factors. If a contract is prepared using a load count, document how the load factor was determined. FSH 2409.11a provides direction regarding calculating load factors.

33 - Quality Control

Competent, experienced specialists shall review sale preparation work. The review must determine that sale preparation followed the timber sale project design and other resource protection requirements or guidance for sale preparation. Reviews must include on-the-ground evaluation of quality and compliance with environmental analysis for a sample of the sales or contracts determined appropriate by the responsible Line Officer. Refer to FSH 2409.12, chapter 60 for quality control procedures pertaining to volume determination.

34 - Tracking And Reporting - Gate 3

Specify individual timber sales if more than one sale is included in the timber sale project design prepared at Gate 2, because tracking from Gate 3 to Gate 6 is for individual timber sales. Tracking at Gate 3 consists primarily of adequate marking of required work in the field and retention of supporting documentation for contract preparation. The Timber Information

Manager (TIM) generates a certification report, titled “Timber Sale Summary,” which is the final action at this gate. The sale passes Gate 3 when the responsible Line Officer for the sale signs the certification report generated by TIM (FSM 2432.36). Gate 3 is locked in TIM when the certification report is printed. Accomplishment timing of this gate is the same as the regular program for projects completed through stewardship, Healthy Forest Restoration Act (HFRA), or good neighbor authority contracts that include disposal of timber or forest products. Accomplishment timing of this gate for stewardship agreements is when the agreement or supplemental project agreement is prepared that disposes of timber or forest products.

34.1 - Documentation

It is important that the completion dates (mm/dd/yyyy) of documents supporting the development of the sale or contract are stated to ensure the most current version is being referenced. If litigation occurs over an environmental or contractual matter in the future, missing or incomplete dates make it difficult to determine the chronology of events or documents. Place the documents in chronological or reverse chronological order within the sale preparation folder. Documentation for the sale preparation folder includes, but is not limited to, the following:

1. Financial efficiency and salability review;
2. Final silvicultural prescriptions;
3. Logging plan;
4. Remote sensing imagery used by field personnel;
5. Layout map;
6. Marking guides;
7. Marking check documentation;
8. Record of paint swatches, color, brand, batch number, and test results;
9. Area determination and accuracy/closure documentation;
10. Skyline profiles (if applicable);
11. Cruise plan, including design;
12. Cruise results (including additional timber);
13. Line Officer certification of cruise;

14. Check cruise documentation;
15. Virtual boundary documentation (risk assessment, vector file/shapefile);
16. Data necessary for appraisal, such as average skid distance or average haul distance;
17. Harvest layout notes;
18. Other resource surveys and data, including specified road survey; and
19. Timber Sale Summary: The timber sale summary is a two-component document. Both components are titled “Timber Sale Summary.” The first component is a narrative document aggregating the details from the above documentation in addition to information gleaned from the timber sale project design and will be attached to the second component.

As a way of verifying that a sale is in full compliance with the NEPA decision, it can be helpful to list or summarize each design criteria in the NEPA decision followed by a brief statement of how the sale complies with the criteria. If actual conditions on the ground result in changes in sale design or layout from those in the NEPA decision, document the change including the reasons so the Line Officer can determine if the differences: (a) are within the scope of the decision, (b) deviate from the decision such that a supplemental decision is needed to support the changes, or (c) warrant changes to the sale to bring it in compliance with the decision. The first component of the summary also provides the necessary information to populate TIM and the contract, while providing information necessary to support the timber sale appraisal.

The second component of the timber sale summary is a certification generated from TIM, also titled “Timber Sale Summary” (sec. 34 of this handbook). The sale or contract must be within the delegated disposal authority of the Line Officer as shown in FSM 2404.28 and comply with the NEPA decision prepared in Gate 2. The first and second components are attached together to form the complete timber sale summary.

34.2 - Sale Tracking and Reporting

Incorporate into TIM the information developed or updated at Gate 3. The following information is needed:

1. Sale, contract, or agreement number and name;
2. State and county;
3. Legal description of the sale, contract, or agreement;
4. Salvage status and percent of salvage volume;

5. Sale objective codes;
6. Cruise volume data;
7. Cutting and payment unit descriptions; and
8. Contract species names and conversion factors.

Update the estimated miles of specified road construction and reconstruction and the estimated bid date for the timber sale in TIM.

After Gate 3 is locked, enter or update the required data for timber sale activities into the Forest Service Activities Tracking System (FACTS) to track the activities on timber sales.