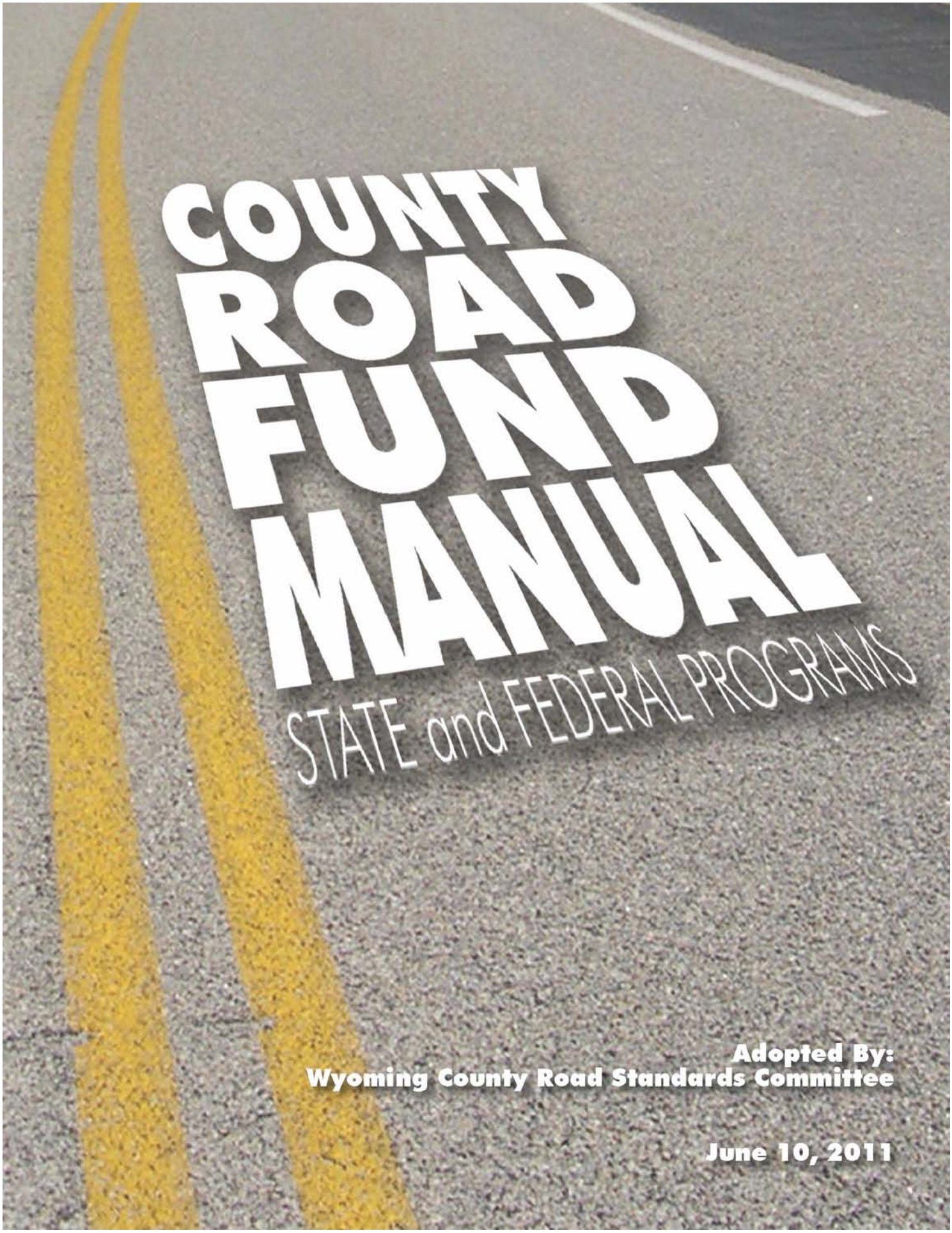

Adopted By:
Wyoming County Road Standards Committee

June 10, 2011

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Technical Report Documentation Page

Report No. FHWA-WY-11/01F	Government Accession No.	Recipients Catalog No.
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Supplementary Notes
WYDOT Technical Contact: Tony Laird, P.E., State Highway Development Engineer

Abstract: This Research Proposal resulted in completion of an updated County Road Fund Manual. A two-phased approach was used. The Research Funding Proposal - Phase 1 was completed and directed to development of Study Objectives, Study Benefits, Work Plan/Scope and Deliverables for a Research Funding Proposal - Phase 2.

The Phase 2 Proposal has been completed and delivered an updated County Road Fund Manual, adopted by the Wyoming County Road Standards Committee, June 10, 2011.

Completion of Research Funding Proposal – Phase 2

Phase 2 Deliverables have been completed and are documented with this Completion Report. The adopted Manual will: serve to guide Wyoming Counties in their administration of road and bridge projects using identified funding sources; outline a uniform set of road and bridge standards and guidelines for Wyoming Counties to follow for the establishment, location, design, construction and reconstruction of roads and bridges under the their jurisdiction; serve Counties in compliance with Wyoming Statute, assist in addressing public complaints, assist in meeting legal challenges, and support program funding; and serve to guide WYDOT and FHWA in administration of their funding programs.

The Wyoming County Road Standards Committee, on June 10, 2011, formally adopted the 2011 County Road Fund Manual. Committee representatives, adopting the Manual, were: Ross Turner, P.E., Scott Larson, P.E., Richard Ladwig, Jeff Johnson, P.E., Travis Conklin, P.E., and Tom Bruce.

Anthony Laird, P.E., WYDOT, and Lee Potter, P.E., FHWA, provided professional services throughout the update of the Manual, supporting the Committee's adoption action.

The Manual has been deployed/distributed in both hard copy and availability on Agency websites.

Key Words Wyoming, County Road Fund Manual, road, bridge, standards and guidelines, WYDOT.		Distribution Statement Unlimited	
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SI* (Modern Metric) Conversion Factors

Approximate Conversions from SI Units

Symbol	When You Know	Multiply By	To Find	Symbol
Length				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
Area				
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
Volume				
ml	milliliters	0.034	fluid ounces	fl oz
l	liters	0.264	gallons	gal
m^3	cubic meters	35.71	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
Mass				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg	megagrams	1.103	short tons (2000 lbs)	T
Temperature (exact)				
°C	Centigrade temperature	1.8 C + 32	Fahrenheit temperature	°F
Illumination				
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
Force and Pressure or Stress				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	pound-force per square inch	psi

Approximate Conversions to SI Units

Symbol	When You Know	Multiply By	To Find	Symbol
Length				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
Area				
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yards	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
Volume				
fl oz	fluid ounces	29.57	milliliters	ml
gal	gallons	3.785	liters	l
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
Mass				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lbs)	0.907	megagrams	Mg
Temperature (exact)				
°F	Fahrenheit temperature	5(F-32)/9 or (F-32)/1.8	Celsius temperature	°C
Illumination				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
Force and Pressure or Stress				
lbf	pound-force	4.45	newtons	N
psi	pound-force per square inch	6.89	kilopascals	kPa

TABLE OF CONTENTS

Manual Section	Pages
Introduction	1
Using This Manual	2-3
Administrative Actions	4-6
Road and Bridge Project Types	7
Road and Bridge Funding Programs	8-9
Project Planning and Eligible Costs	10-11
Engineering Services—Consultant Services and Consultant Selection	12-13
Road and Bridge Design Criteria and Design Values	14-23
Project Environmental Documentation and Public Involvement	24-29
Roadside Safety	30-31
Pavement Structure and Surface Treatment	32-33
Drainage—Pavements, Structures, and Facilities	34-36
Public Right-of-Way	37
Utility Accommodation	38
Traffic Control Devices	39
Other Design Elements	40-41
Project Report	42-44
Plan Development and Contracting Provisions	45-50
Contract Documents—Plans and Specifications	51-52
Contract Bid and Project Award	53-54
Construction and Construction Engineering	55-60
Post Construction	61
Definitions	62-65
Appendix 1 through 8	66-76

INTRODUCTION

This version of the *County Road Fund Manual* has been revised to serve two separate but related purposes: primarily to serve as a reference guide for each county in its use of County Road Construction Funds (W.S. § 24-2-110 et. al) (see Appendix 1) and to serve as a reference guide for the counties, the Wyoming Department of Transportation (WYDOT), and the Federal Highway Administration for numerous state-funded and federally funded transportation programs.

The County Road Construction Fund provides for the construction and improvement of county roads. The Board of County Commissioners is responsible for using these funds to design and construct, reconstruct, resurface, and maintain a county road system. These responsibilities are best accomplished with an understanding of related duties.

County Commissioner duties include the following:

- Establish a road construction account separate from other county fund accounts.
- Develop a county road system and develop a priority project list.
- Explore funding sources, County Road Construction Funds, and state- and federally funded transportation programs.
- Develop projects—from planning to design to contract plans and specifications—using professional resources, either in-house resources or private sector consultants.
- Advertise contract documents for bidding, and award project contract.
- Ensure construction supervision, inspection, measurement, and acceptance of materials; final inspection; and acceptance of project.
- Ensure progress payments, final payment, and final accounting of project costs.

This Manual has been developed to provide the minimum requirements and guidelines needed to meet County Road Fund legislation and fulfill County Commissioner responsibilities and duties. To assist County Commissioners in this effort, the Manual provides for a defined level of oversight by a Wyoming-registered professional engineer during development of the project design and for project contract documents, project construction, and project final acceptance.

This edition of the Manual has been developed to assist each county, the Wyoming Department of Transportation, and the Federal Highway Administration as a reference guide for numerous state-funded and federally funded transportation programs. Current funding programs, directed to the construction of roads and streets and available for use on the county road system, are presented in Road and Bridge Funding Programs, along with cited references to assist in understanding eligible project costs and agency requirements. Minimum requirements and guidelines are presented for these programs.

USING THIS MANUAL

This Manual has been developed as a resource guide and is not intended to provide all technical or legal information and requirements of Wyoming statutes or state and federal funding programs. Selected Wyoming statutes have been referenced throughout the Manual and those statutes, with a brief description of content, are summarized in Appendix 1. To the extent possible, the requirements of state and federal funding programs have been incorporated and/or references provided to assist the Manual user in gaining familiarity with those program requirements.

Early Project Planning can be completed using the following sections of this Manual.

- Administrative Actions.
- Road and Bridge Project Types.
- Road and Bridge Funding Programs.
- Project Planning and Eligible Costs.
- Engineering Services—Consultant Services and Selection.

Documentation—A project type is selected, a cooperative agreement is executed, a preliminary project report is completed, and administrative actions are completed.

Preliminary Engineering for the project type is completed using the following sections of this Manual.

- Administrative Actions.
- Road and Bridge Design Criteria and Design Values.
- Project Environmental Documentation.
- Roadside Safety.
- Pavement Structure and Surface Treatment.
- Drainage—Pavements, Structures, and Facilities.
- Public Right-of-Way.
- Utility Accommodation.
- Traffic Control Devices.
- Other Design Elements.

Documentation—A final project report, preliminary design, design exceptions and environmental documentation are completed. Right-of-way agreements and utility agreements, if needed, are initiated. Administrative actions are completed.

Final Engineering can then be scheduled and completed using the following sections of this Manual.

- Administrative Actions.
- Plan Development And Contracting Provisions.
- Contract Documents – Plans And Specifications.

Documentation—Right-of-way agreements and utility agreements are finalized. Right-of-way certificates, utility certificates, and contract documents (including additional documents) are completed. Administrative actions are completed.

Project Bidding and Award is completed using the following sections of this Manual.

- Administrative Actions.
- Contract Bid and Project Award.

Documentation—Project is awarded. Administrative actions are completed.

Construction and Construction Engineering is completed using the following sections of this Manual.

- Administrative Actions.
- Construction and Construction Engineering.

Documentation—Daily and monthly documentation is completed to certify that the project has been constructed in conformance with contract documents. Daily and monthly documentation is completed to assure compliance with contracting provisions. Daily and monthly documentation is completed to assure final payment to the contractor and project financial accounting. Administrative actions are completed.

Project Final Acceptance is completed using the following sections of this Manual.

- Administrative Actions.
- Construction and Construction Engineering.
- Post Construction.

Documentation—Project is final inspected and accepted. County certifies completion to WYDOT, see Appendix 7, for State and Federal funded projects.

ADMINISTRATIVE ACTIONS

This Manual prescribes and recommends a series of administrative actions. These actions are summarized for quick reference and ease of compliance.

Board of County Commissioners: (All projects) The Board, or as delegated to a public employee, is responsible for completion of the authorizations or approval actions in the following table. All references are to sections of this Manual. The Board retains the authority to deviate from the requirements of this Manual. For state and federally funded projects, any deviations should be documented in the Project Report.

Authorization or Approval	Manual Reference
Project report	Project Report
Design exceptions	Road and Bridge Design Criteria and Design Values
Cooperative (project) agreement	Requires the use of this Manual
Contract documents	Contract Documents
Environmental Documentation	Environmental Documentation
Right-of-Way certifications	Public Right-of-Way
Utility certifications	Utility Accommodation
State and federal permits	Other Design Elements
Contract bidding	Contract Bidding and Project Award
Project award	Contract Bidding and Project Award
Construction and engineering	Construction and Construction Engineering
Financial accounting	Construction and Construction Engineering
Maintenance	Post-Construction
Remain-in-service	Post-Construction

Wyoming Department of Transportation (WYDOT): (State and federally funded projects) WYDOT will retain authority, by cooperative/project agreement, for the following actions.

Action	Manual Reference
Execute cooperative (project) agreement	Requires the use of this Manual
Concur in project report	Project Report
Concur in design exceptions	Road & Bridge Design Criteria and Design Values
Approval of bridges/structures	Administrative Actions; Engineering Services
Approval of contract documents	Contract Documents
Approval of environmental document	Environmental Documentation
Receipt of right-of-certifications	Public Right-of-Way
Receipt of utility certifications	Utility Accommodation
Concur in project award	Contract Bidding and Project Award
Final accept project construction	Construction and Construction Engineering
Require financial accounting (audit)	Construction and Contract Administration
Require perpetual maintenance	Post-Construction
Require perpetual remain-in-service	Post-Construction

Wyoming-Registered Professional Engineers:

County Road Funded Projects: It is recommended that the project report, design exceptions, contract documents, construction, and final inspection and acceptance of the project either be completed under the direct supervision and stamped and signed by a Wyoming-registered professional engineer or be reviewed and accepted by a Wyoming-registered professional engineer. See W.S.33-29-135, Appendix 1.

State-Funded and State-Administered Federally Funded Projects: Contract documents will be developed under the direct supervision of a Wyoming-registered professional engineer and all contract plans will be stamped and signed.

All Projects: W.S. 24-2-106 establishes that the WYDOT State Bridge Engineer (delegated authority from Director and Chief Engineer) must approve all contract documents for the design, prior to the construction, of all bridge/structures > 20 feet in length, regardless of funding source. W.S. 24-1-132 requires all bridges that are to be constructed must be designed by a Wyoming-registered professional engineer. After construction of any bridge, the county's final payment to the contractor cannot be made until the completed bridge is inspected by the designer, consistent with W.S. 24-2-106.

Wyoming-Registered Professional Land Surveyor: It is recommended that surveys for terrain, land ownership, recordation, and construction surveying/staking be completed under the direct supervision of and stamped and signed by a Wyoming-registered professional land

surveyor. See W.S.33-29-135, Appendix 1. Terrain surveys and construction surveying/staking can be completed under the direct supervision of and stamped and signed by a Wyoming-registered professional engineer.

ROAD AND BRIDGE PROJECT TYPES

Five project types are presented in this Manual to guide both funding programs and project development procedures. Four project types are defined and will be used to develop project development procedures including geometric design values to be used during development of contract plans and cost estimates, and to develop program requirements based on funding programs. Three project types are defined by the pavement or bridge design strategy proposed, and the fourth type is defined as safety improvements. A fifth project type is presented as Other and is presented only for informational purposes.

New Construction on New Alignment: This project type covers those projects that will be constructed on a new alignment to better serve a county's projected growth or development, and those projects that will provide an improved roadway and bridge alignment using a new centerline. This project type will analyze a full range of new pavement design strategies and new bridge structures, including the replacement of existing structures, and will evaluate other needs, such as capacity, intersection operations, and safety clear zones.

Reconstruction on Existing Alignment: This project type covers those projects that will be constructed on existing alignments, including minor adjustments to existing centerline for improved horizontal or vertical alignment and widening for lane widths or shoulder widths. This project type will analyze a range of pavement design strategies (most of which will use the existing pavement structure), structural improvements to existing bridge structures, and upgrade of geometric, operational, and safety roadway elements.

Resurfacing and Preservation (Maintenance) on Existing Alignment: This project type covers the broadest range of projects that will improve existing roads and bridges to extend the service life of the facility. This project type will analyze pavement and bridge needs to provide additional pavement structure (structural overlays) or extended service life (resurfacing), bridge deck repair or overlay and other repairs, and limited improvements to other operational or roadside features.

Safety Improvements: This project type covers the full range of safety-type improvements, from signing to improvements to horizontal and vertical alignments. These improvements are based on crash history and/or the potential to reduce the frequency or severity of specific crash types, resulting in a higher crash modification factor (an estimate of reduction in crashes expected after construction of a safety improvement).

Other: Projects covered typically do not involve construction of roadway improvements and are presented for information only. Guidance and standards are not presented, in this Manual, for these project types.

ROAD AND BRIDGE FUNDING PROGRAMS

Five project types are presented for discussion of currently available funding programs. These project types influence the availability of funding as many funding programs, especially federal and state, are directed to legislative or regulatory program purposes, goals, or strategies. Typically, legislated or regulatory programs are continuously extended as part of subsequent legislative actions, such as new transportation legislation or funding authorizations, and as a result warrant identification with the understanding that new programs or program revisions not listed may be implemented during the life of this Manual.

The following abbreviations are used: SA are WYDOT-administered state funds and programs; FA are WYDOT- and FHWA-administered federally funded programs; USC is the United States Code; 2005 SAFETEA-LU is the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; OP is WYDOT operating policies.

New Construction on New Alignment

County Road Funds—established by Wyoming Statute, WS § 24-2-110
SA—Industrial Roads Program—established by Wyoming Statute, WS § 24-5-118, OP 2-5
FA—Commission Road Improvement Program—authorized by WYDOT, OP 2-1
FA—Highway Bridge Replacement and Rehabilitation Program—23 USC 144, OP 2-6
FA—Urban System Program—OP 2-4
FA—Emergency Relief Program—23 USC 101, 120, 125, 315

Reconstruction or Rehabilitation on Existing Alignment

County Road Funds—established by Wyoming Statute, WS § 24-2-110
SA—Industrial Roads Program—established by Wyoming Statute, WS § 24-5-118, OP 2-5
FA—Commission Road Improvement Program—authorized by WYDOT, OP 2-1
FA—Highway Bridge Replacement and Rehabilitation Program—23 USC 144, OP 2-6
FA—Urban System Program—OP 2-4
FA—High Risk Rural Roads Program (limited application)—Section 1404 of the 2005 SAFETEA-LU
FA—Congestion Mitigation and Air Quality Improvements—23 USC 149
FA—Emergency Relief Program—23 USC 101, 120, 125, 315

Resurfacing and Preservation (Maintenance) on Existing Alignment

County Road Funds—established by Wyoming Statute, WS § 24-2-110
FA—Commission Road Improvement Program—authorized by WYDOT, OP 2-1
FA—Highway Bridge Replacement and Rehabilitation Program—23 USC 144, OP 2-6
FA—Urban System Program—OP 2-4
FA—High Risk Rural Roads Program (limited application)—Section 1404 of the 2005 SAFETEA-LU
FA—Safety Emphasis Program (limited application)—23 USC148; OP 13-9
FA—Congestion Mitigation and Air Quality (CMAQ)—23 USC 149
FA—Emergency Relief Program—23 USC 101, 120, 125, 315

Safety Improvements

County Road Funds—established by Wyoming Statute, WS § 24-2-110
FA—Urban System Program—OP 2-4
FA—High Risk Rural Roads Program—Section 1404 of the 2005 SAFETEA-LU
FA—Safety Emphasis Program—23 USC148; OP 13-9
FA—Safe Routes to School—Section 1404 of the 2005 SAFETEA-LU, OP 2-8

Other

FA—Transportation Enhancement Activities, including Local (TEAL), 23 USC 133, OP 3-3
FA—Railroad-Highway Crossing Protection Program, OP 13-1
FA—Public Transportation Capital Investment Program, 49 USC 5309

PROJECT PLANNING AND ELIGIBLE COSTS

PROJECT PLANNING

Early project planning is needed, first—to identify and compile available information and second—to use this information to clearly define the roadway corridor's existing and future needs and to establish the purpose of the project, leading to selection of a project type. Project planning should including evaluation of information presented in road and bridge funding programs.

The selection of a project type should be supported by analysis of information gained from existing planning studies or completing those studies in advance or concurrent with early project development.

Planning Studies:

County's Comprehensive or Transportation Plan.
County's adopted Land Use Plan.
Roadway corridor Functional Classification.
Current Traffic Volumes and Future Year Traffic Projections.
Design Vehicle.
Bridge Evaluation (see Appendix 4).
Inventory of Environmental Resources: Wetlands, Cultural, Others.
Crash History.
County's Need Analysis or Management Programs, if Available.
Funding Program (County, State, Federal) & County Share of Project Cost.
Availability of Funds (Year of Construction).
Funding Program Eligible Costs.
As-Constructed Plans.
Field Reconnaissance.

Project Planning Deliverables—Project Description:

Selection of Project Type.
Project Limits.
Preliminary selection of Design Criteria and Values, design practices, and design elements (Roadside Safety, Drainage, Others) from this Manual.
Preliminary determination of Environmental Document Type.
Preliminary determination of Utility Accommodations and Right-of-Way limits.
Selection of Professional Engineering Services and Consultant Services.
Preliminary determination of Total Project Cost.
Funding Plan—Program, Funds Available and County Share of Project Cost.
Funding Program—Eligible Costs and Basis for Reimbursement.
Funding Agency Requirements and Cooperative (Project) Agreement Provisions.

ELIGIBLE COSTS—County Road Funds

County Road Fund monies are to be used to design and construct any of the four project types. These monies may be expended for the following types of work:

Development of planning studies.

Surveys for both the location (terrain) and acquisition of right-of-way (land ownership) for county roads; surveys for location, design, and construction projects.

Mapping required for county roads.

Direct design management of County Road Fund projects.

Location, investigation, and testing of surface pits, including borrow pits.

Preparation of contract documents.

Preparation of environmental analysis and documentation.

Relocation of utilities on county roads when the utility companies have prior right-of-way.

Acquisition of right-of-way.

Grading, draining, fencing, cattle guards, pavements, structures, and all other items for construction of any of the four project types.

Signing, striping, and delineation.

Direct construction management of County Road Fund projects.

Matching funds for state and federal-aid funded projects.

Those costs needed to develop construction projects consistent with an accepted Project Report.

ELIGIBLE COSTS—State-Funded and Federally Funded Projects

Eligible costs for each funded program or project are based on legislative or regulatory program purposes, goals, or strategies. To understand each program's eligible costs, consult references cited in the road and bridge funding programs and this Manual and contact state and federal agency representatives.

ENGINEERING SERVICES—CONSULTANT SERVICES AND CONSULTANT SELECTION

Wyoming-Registered Professional Engineer Services:

County Road Funded Projects: The intent of enabling legislation is to ensure that projects funded with County Road Funds are developed, designed, and constructed under the guidance and direction of a Wyoming-registered professional engineer. For these projects, it is recommended that the project report, design exceptions, contract documents, construction, and final inspection and acceptance of the project be either completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional engineer or reviewed and accepted by a Wyoming-registered professional engineer. See W.S. 33-29-135, Appendix 1.

State Funded and State-Administered Federal Funded Projects: Contract documents will be developed under the direct supervision of a Wyoming-registered professional engineer and all contract plans will be stamped and signed.

All Projects: W.S. 24-2-106 establishes that the WYDOT State Bridge Engineer (delegated authority from Director and Chief Engineer) must approve all contract documents for the design, prior to the construction, of all bridge/structures > 20 feet in length, regardless of funding source. W.S. 24-1-132 requires that all bridges to be constructed must be designed by a Wyoming-registered professional engineer. After construction of any bridge, the county's final payment to the contractor cannot be made until the completed bridge is inspected by the designer, consistent with W.S. 24-2-106.

Consultant Services:

WYDOT's Engineering Services Section will assist the county in determining if consultant services are needed to complete the project design and construction efforts. These services could include: planning services to develop planning studies; Wyoming-registered professional engineering services for roadway design, hydraulic and scour analysis, bridge design, contract plans, construction, or contract administration; professional land surveyor services for terrain, land ownership, recordation, and construction surveying/staking (terrain surveys and construction surveying/staking can be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional engineer); environmental planning services for environmental analysis and documentation; other specialized services, such as geotechnical, pavement design, drainage design, and right-of-way acquisition.

Consultant Services and Selection:

For all projects, the selection of a consultant for any project-required service should follow a competitive qualification-based selection process.

A formal process, with a Request for Qualifications/Request for Proposal (RFQ/RFP), can be used for consultant service agreements of sufficient work scope, complexity, or cost ($50,000.00 or more). The RFP may require submission of a preliminary cost estimate and scope of work consistent with the county's description of proposed work; however, for state- and federally funded projects, initial consultant selection must be qualification based. The preliminary cost estimate should be submitted under a separate cover from the RFP and evaluated only after the qualification-based ranking has been completed.

A Request for Qualifications/ Statement of Interest is a less formal but still competitive process that can be used for all other consultant services. This is often referred to as a Small Purchase Agreement, which can be used for all funding sources.

For services with a total cost less than $7,500.00 and that will use County Road Funds or state funds (not federal funds), a service agreement/purchase order can be used.

An alternate procedure and template policy is available to a county, may be used for all state- and federally funded projects, and is recommended for use on all projects. The template policy may be adopted as written, or the template can be revised consistent with program requirements and developed as a county procurement policy, subject to WYDOT approval. The template policy and instructions may be found in Operating Policy 40-1 or at www.dot.state.wy.us then selecting "Business with WYDOT," then selecting "Local Public Agencies," and then selecting "Template Policy."

The Wyoming Procurement Act is another alternative consultant procurement procedure that is available for projects funded with County Road Funds but is not applicable to state and federal funds. This procedure is provided by state statute and is directed to state agencies, and is not required of counties, but does provide an acceptable procedure for County Road Fund projects. See Appendix 2.

Additional information is available from WYDOT at:
http://www.dot.state.wy.us/wydot/business_with_wydot/consultants

ROAD AND BRIDGE DESIGN CRITERIA AND DESIGN VALUES

Geometric design criteria and values for roads and bridges are presented for four project types: New Construction on New Alignment, Reconstruction on Existing Alignment, Resurfacing and Preservation (Maintenance) on Existing Alignment, and Safety Improvements. The design values are then adjusted, as needed, by the functional classification of the roadway, terrain features, and design traffic volumes.

New Construction on New Alignment: Table 1 presents design criteria and values for New Construction on New Alignment by functional classification. The design criteria and design values are based on the following project work categories and design practices:

Work Categories

The design criteria and design values are based on the following project work categories:

Pavements: Construction of a new pavement structure, to include all pavement types from plant mix or Portland cement pavements to blended aggregates, using a selected design life (design year), design year traffic volumes, established design procedures, and construction practices.

Bridges: Construction of a new bridge structure greater than 20 feet in length and includes the replacement of existing structures.

Safety: This work category should include roadside design features to reduce the potential for and/or the severity of crashes. Safety work should include construction of a safety clear zone (clearance to obstructions) with widths from *AASHTO Roadside Design Guide* and construction of roadside safety hardware, including guardrail and sign mounting hardware, that meets current safety design standards (see Definitions). See the Roadside Safety Section of this Manual for additional discussion of safety design features.

Operational: Construction of intersections serving design year traffic movements.

Design Practices

Design criteria and design values are based on use of the following design practices:

Design Life: A design life (design year) will be selected with a 20-year design life, from year constructed, recommended for this project type.

Design Speed: A range of design speeds are available. The design speed will be selected based on the functional classification of the roadway, terrain features, design year traffic volumes, and funding agency legislative requirements or policy. In general, higher functional classification and traffic volumes warrant a higher selected design

speed with adjustment for terrain features. The selected design speed will be set at or within 10 mph of the regulatory posted maximum speed limit.

Regulatory posted maximum speed limit: WS 31-5-301 establishes the maximum speed limit at 65 miles per hour for paved roadways and 55 miles per hour for unpaved roadways. Local authorities, in their respective jurisdictions, may determine that a maximum speed limit which differs from this statute is reasonable and safe.

Design Criteria and Design Values: Selected design criteria and design values are presented to guide the geometric design elements. Based on proper selection of design speed, certain design criteria and design values, such as horizontal and vertical alignment, can be set to meet that design speed while other design criteria and design values, such as travel lane and shoulder widths, can be based on design year traffic volumes.

The design values have been set to provide increased flexibility in the selection of values that both satisfy transportation safety and mobility needs while considering project cost, limited funding, and community or environmental concerns. As a result, the use of minimum values only for all project related design values and design practices is not recommended.

A design exception is an administrative action that may be appropriate when it is difficult or cost prohibitive to achieve full compliance with a design value, as presented in this Manual. These actions must be fully documented (see Appendix 3) with a comprehensive presentation describing the basis for selecting a design value that does not meet the requirements of this Manual.

Horizontal Alignment: The horizontal alignment will meet the selected design speed based on both the combination of curve radius and super elevation and sight distance. Super elevations will be based on e_{max} = 6%, with e_{max} = 8% recommended for major collectors with higher design year traffic volumes. Local/residential roads and streets with low speeds, adjacent development, frequent intersections with cross roads, and other urban-type features should make use of lesser super elevation rates e_{max} = 4%, and in some locations, the use of super elevation may not be practicable.

Vertical Alignment: The vertical alignment will meet the selected design speed based on both the combination of curve length and grades (K-factor) and sight distance. Vertical alignments, coordinated with horizontal alignment, should be evaluated for passing sight distance and include frequent passing sections.

Bridge Design Values: For state- and federally funded bridges, the minimum bridge roadway widths are set to match with the approach roadway widths, which are the combination of travel lane and shoulder widths. For those functional classifications, adjusted by traffic volumes, that do not require a shoulder, the minimum bridge width is set at the travel way (lane) widths plus a 2-foot shy distance to the bridge curb/rail. For

county funded bridges, the minimum bridge roadway widths are set to match with the approach roadway widths, which are the combination of travel lane and shoulder widths. For those functional classifications, adjusted by traffic volumes, that do not require a shoulder, the minimum bridge width is set at the travel way (lane) widths plus a 1-foot shy distance to the bridge curb/rail.

Bridge vertical clearances and structural capacities are applicable to all Funding Programs.

Table 1. New Construction on New Alignment—Design Criteria and Design Values*

Design Criteria	Functional Classification Major Collector	Functional Classification Minor Collector	Functional Classification Local
Design Speed (DS) – County			
Level Terrain	Select 65 mph to 30 mph	Select 65 mph to 30 mph	Select 55 mph to 20 mph
Rolling Terrain	Select 65 mph to 30 mph	Select 65 mph to 30 mph	Select 55 mph to 20 mph
Mountainous Terrain	Select 55 mph to 20 mph	Select 55 mph to 20 mph	Select 45 mph to 20 mph
Design Speed (DS) – SA & FA			
Level Terrain	Same as County	Same as County	Same as County
Rolling Terrain	Same as County	Same as County	Same as County
Mountainous Terrain	Same as County	Same as County	Same as County
Travel Lane Width – County			
Vehicles/day, Under 400	10 Feet Minimum	10 Feet Minimum	9 Feet Minimum
Vehicles/day, 400-2000	11 Feet Minimum	11 Feet Minimum	10 Feet Minimum
Vehicles/day, Over 2000	12 Feet	12 Feet	11 Feet Minimum
Lane Width – SA & FA			
Vehicles/day, Over 2000	11 Feet Minimum 12 Feet	11 Feet Minimum 12 Feet	11 Feet Minimum 11 Feet Minimum
Shoulder Width – County			
Vehicles/day, Under 400	0 Feet Minimum	0 Feet Minimum	0 Feet Minimum
Vehicles/day, 400-2000	2 Feet Minimum	2 Feet Minimum	2 Feet Minimum
Vehicles/day, Over 2000	4 Feet Minimum	4 Feet Minimum	2 Feet Minimum
Shoulder Width – SA & FA			
Vehicles/day, Under 400	2 Feet Minimum	2 Feet Minimum	0 Feet Minimum
Vehicles/day, 400-2000	4 Feet Minimum	4 Feet Minimum	2 Feet Minimum
Vehicles/day, Over 2000	6 Feet Minimum	6 Feet Minimum	4 Feet Minimum
Horizontal Alignment – County	Meet Design Speed	Meet Design Speed	Meet Design Speed
Horizontal Alignment - SA & FA	Meet Design Speed	Meet Design Speed	Meet Design Speed
Vertical Alignment – County	Meet Design Speed	Meet Design Speed	Meet Design Speed
Vertical Alignment – SA & FA	Meet Design Speed	Meet Design Speed	Meet Design Speed

Grades (Maximum) – County Level Terrain Rolling Terrain Mountainous Terrain	6-7% (65 to 30 MPH DS) 7-9% (65 to 30 MPH DS) 9-12% (55 to 30 MPH DS)	6-7% (65 to 30 MPH DS) 7-9% (65 to 30 MPH DS) 9-12% (55 to 30 MPH DS)	6-8% (55 to 20 MPH DS) 7-11% (55 to 20 MPH DS) 12-16% (45 to 20 MPH DS)
Grades (Maximum) – SA & FA Level Terrain Rolling Terrain Mountainous Terrain	Same as County Same as County Same as County	Same as County Same as County Same as County	Same as County Same as County Same as County
Bridge Roadway Width – County	22 – 32 Feet	22 – 32 Feet	20 – 26 Feet
Bridge Roadway Width–SA & FA	26 – 36 Feet	26 – 36 Feet	26 - 30 Feet
Bridge Vertical Clearance ** Over Public Road** Over NHS** Over Railroad	14 Feet Minimum 16 Feet Minimum 23.5 Feet	14 Feet Minimum 16 Feet Minimum 23.5 Feet	14 Feet Minimum 16 Feet Minimum 23.5 Feet
Structural Capacity *** – County Design Vehicle/ Design Specification	HL-93/ LRFD or HS-20/Standard Spec.	HL-93/ LRFD or HS-20/Standard Spec.	HL-93/ LRFD or HS-20/Standard Spec.
Structural Capacity*** – SA & FA Design Vehicle and Design Specification	HL-93/ LRFD	HL-93/ LRFD	HL-93/ LRFD

*Design Values are taken from AASHTO referenced documents but do not necessarily use the same controlling limits, including design speeds, traffic volumes, and terrain features.
**An additional 0.5 feet of vertical clearance for an overpass of a state highway is recommended to allow for future surfacing.
***See Definitions.

Reconstruction on Existing Alignment: Table 2 presents design criteria and design values for Reconstruction on Existing Alignment by functional classification. The design criteria and design values are based on the following project work categories and design practices.

Work Categories

The design criteria and design values are based on the following project work categories:

Pavements: Reconstruction of an existing pavement structure and may include widening to improve travel lane or shoulder widths. This work category should use a selected design life (design year), design year traffic volumes, and established design procedures and construction practices.

Bridges: Bridge structures should be evaluated (see Appendix 4) to determine elements in an advanced state of deterioration and determine the best course of action. This work category includes rehabilitation of an existing bridge structure greater than 20 feet in length to restore the structural integrity or to upgrade to current safety standards. (The replacement of a bridge would be a New Construction on New Alignment project

type). Work can include widening to match approach roadway improvements to travel lane or shoulder widths, with any proposed widening consistent with the design values required for New Construction; work can include any improvement needed to extend the functional life of the structure and upgrades to current safety standards.

Safety: This work category will require an evaluation of a minimum five-year crash history. Based on that evaluation, safety work could include replacement or additional roadside safety hardware, including guardrail and sign mounting hardware that meets current safety design standards (see Definitions). This work category could also include construction of a safety clear zone (clearance to obstructions) with widths from *AASHTO Roadside Design Guide* and fore slope rates, minimum 1V:4H, recommended. See the Roadside Safety Section of this Manual for additional discussion of safety design elements.

Operational: Improvements to all intersections legs to serve design year traffic movements.

Design Practices

The design criteria and design values, see Table 2, are based on use of the following design practices:

Design Life: A design life (design year) will be selected, typically 10 or 15 years, from year to be constructed.

Design Speed: A design speed will be selected based on the functional classification of the roadway, the terrain features, and funding agency legislative requirements or policy. The selected design speed will be set at or within 10 mph of the regulatory posted maximum speed limit.

Regulatory posted maximum speed limit: WS 31-5-301 establishes the maximum speed limit at 65 miles per hour for paved roadways and 55 miles per hour for unpaved roadways. Local authorities, in their respective jurisdictions, may determine that a maximum speed limit which differs from this statute is reasonable and safe.

Design Criteria and Design Values: Selected design criteria and design values are presented to guide the geometric design elements. Based on proper selection of design speed, certain design criteria and design values, such as horizontal and vertical alignment, can be set to meet that design speed while other design criteria and design values, such as travel lane and shoulder widths, can be based on design year traffic volumes.

The design values have been set to provide increased flexibility in the selection of values that both satisfy transportation safety and mobility needs while considering project cost, limited funding, and community or environmental concerns. As a result, the use of minimum values only for all project related design criteria and design practices is not recommended.

A design exception is an administrative action that may be appropriate when it is difficult or cost prohibitive to achieve full compliance with a design value, as presented in this Manual. These actions must be fully documented (see Appendix 3) with a comprehensive presentation describing the basis for selecting a design value that does not meet the requirements of this Manual.

Horizontal Alignment: The horizontal alignment will meet the selected design speed based on both the combination of curve radius and super elevation and the sight distance. Super elevations will be based on e_{max} = 6%, with e_{max} = 8% recommended for major collectors with higher design year traffic volumes. Local/residential roads and streets with low speeds, adjacent development, frequent intersections with cross roads, and other urban-type features should make use of lesser super elevation rates, e_{max} = 4%, and in some locations, the use of super elevation may not be practicable.

For this project type, isolated horizontal curve/curves can remain-in-place if both the combination of curve radius and super elevation and the sight distance meet a reduced design speed within 10 mph of the selected design speed. Advance curve warning signing for these curves should be in accordance with the *Manual on Uniform Traffic Control Devices.*

Vertical Alignment: The vertical alignment will meet the selected design speed based on both the combination of curve length and grades (K-factor) and the sight distance. Vertical alignments, coordinated with horizontal alignment, should be evaluated for passing sight distance. For this project type, isolated vertical curve/curves can remain-in-place if both the combination of curve length and grade, and sight distance meet a reduced design speed within 10 mph of the selected design speed.

Table 2. Reconstruction on Existing Alignment—Design Criteria and Design Values*

Design Criteria	Functional Classification Major Collector	Functional Classification Minor Collector	Functional Classification Local
Design Speed (DS) – County			
Level Terrain	Select 65 mph to 30 mph	Select 65 mph to 30 mph	Select 55 mph to 20 mph
Rolling Terrain	Select 65 mph to 30 mph	Select 65 mph to 30 mph	Select 55 mph to 20 mph
Mountainous Terrain	Select 55 mph to 20 mph	Select 55 mph to 20 mph	Select 45 mph to 20 mph
Design Speed (DS) – SA & FA			
Level Terrain	Same as County	Same as County	Same as County
Rolling Terrain	Same as County	Same as County	Same as County
Mountainous Terrain	Same as County	Same as County	Same as County
Travel Lane Width – County			
Vehicles/day, Under 400	10 Feet Minimum	10 Feet Minimum	9 Feet Minimum
Vehicles/day, 400-2000	11 Feet Minimum	11 Feet Minimum	10 Feet Minimum
Vehicles/day, Over 2000	12 Feet	12 Feet	11 Feet Minimum
Travel Lane Width – SA & FA			
Vehicles/day, Over 2000	11 Feet Minimum 12 Feet	11 Feet Minimum 12 Feet	10 Feet Minimum 11 Feet Minimum
Shoulder Width – All Funding Programs	Minimum is Existing Widths for all Traffic Volumes	Minimum is Existing Widths for all Traffic Volumes	Minimum is Existing Widths for all Traffic Volumes
Horizontal Alignment – County			
Isolated Curves	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS
Horizontal Alignment - SA & FA			
Isolated Curves	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS
Vertical Alignment – County			
Isolated Curves	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS
Vertical Alignment – SA & FA			
Isolated Curves	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS	Meet Design Speed Meet Reduced DS
Grades (Maximum) – All Funding Programs	Existing Grades for all Terrains	Existing Grades for all Terrains	Existing Grades for all Terrains
Bridge Roadway Width–All Funding Programs	Approach Roadway Width	Approach Roadway Width	Approach Roadway Width
Bridge Vertical Clearance Over Public Road & RR	Maintain Existing	Maintain Existing	Maintain Existing
Structural Capacity **	Minimum Inventory Load Rating Factor of 0.8	Minimum Inventory Load Rating Factor of 0.8	Minimum Inventory Load Rating Factor of 0.8

*Design Values are taken from AASHTO referenced documents but do not necessarily use the same controlling limits, including design speeds, traffic volumes, and terrain features.

**See Definitions.

Resurfacing and Preservation (Maintenance) on Existing Alignment:

Table 3 presents design criteria and values for Resurfacing and Preservation on Existing Alignment by functional classification. The design criteria and design values are based on the following project work categories and design practices:

Work Categories

The design criteria and design values are based on the following project work categories:

Pavements: Resurfacing or preservation of an existing pavement structure, which includes a broad range of pavement improvements from a maximum 2-inch plant mix pavement (PMP) overlay (paved roadway) to reshaping followed by a blended aggregate base and surface treatment (unpaved roadway). This work category has an upper limit defined as construction of a single pavement lift, maximum 2-inch plant mix pavement (PMP) overlay, and does not require the use of a selected design life. A Reconstruction on Existing Alignment type of project should be used if the roadway requires construction of a pavement structure exceeding this upper limit.

Bridges: Bridge structures should be evaluated (see Appendix 4) to determine elements in an advanced state of deterioration and determine the best course of action. This work category provides for preservation strategies to extend the service life or to upgrade to current safety design standards on an existing bridge structure greater than 20 feet in length.

Safety: This work category can include replacing or constructing additional roadside safety hardware, including guardrail and sign mounting hardware, to meet current safety design standards (see Definitions). Any safety concerns resulting from project construction, including pavement edge drop-offs or non-standard guardrail heights, will be corrected.

Operational: Improvements to all intersection legs to improve the pavement structure and better delineate traffic movements.

Design Practices

The design criteria and design values are based on use of the following design practices:

Design Life: A design life is not required.

Design Speed: The roadway horizontal alignment should be evaluated against a theoretical design speed using alignment criteria, including the recommendation that the theoretical design speed be within 10 mph of the regulatory posted maximum speed

limit. This recommendation is for those roadways with a regulatory posted maximum speed limit at or above 55 mph.

Regulatory posted maximum speed limit: WS 31-5-301 establishes the maximum speed limit at 65 miles per hour for paved roadways and 55 miles per hour for unpaved roadways. Local authorities, in their respective jurisdictions, may determine that a maximum speed limit which differs from this statute is reasonable and safe.

Roadway Alignment: It is recommended that the horizontal alignment be within 10 mph of the theoretical design speed or the project include installation of horizontal alignment advance curve warning signs in accordance with the *Manual on Uniform Traffic Control Devices*. This project type will not improve the roadway vertical alignment.

A design exception is an administrative action that may be appropriate when it is difficult or cost prohibitive to achieve full compliance with a design value, as presented in this Manual. These actions must be fully documented (see Appendix 3) with a comprehensive presentation describing the basis for selecting a design value that does not meet the requirements of this Manual. For this project type, a design exception would only be required when the proposed project design would not maintain the existing roadway or traveled way widths (lane widths, shoulder widths, bridge roadway widths), or when the proposed project design would not maintain bridge vertical clearance.

Table 3. Resurfacing or Preservation on Existing Alignment—Design Criteria and Design Values

Design Criteria	Functional Classification Major Collector	Functional Classification Minor Collector	Functional Classification Local
Design Speed (DS) – All Funding Programs Paved Roadway Unpaved Roadway	Maintain Existing Maximum 65 MPH Maximum 55 MPH	Maintain Existing Maximum 65 MPH Maximum 55 MPH	Maintain Existing Maximum 65 MPH Maximum 55 MPH
Travel Lane Width – All Funding Programs	Maintain Existing	Maintain Existing	Maintain Existing
Shoulder Width – All Funding Programs	Maintain Existing Widths	Maintain Existing Widths	Maintain Existing Widths
Roadway Alignment – All Funding Programs	Maintain Existing	Maintain Existing	Maintain Existing
Grades – All Funding Programs	Maintain Existing	Maintain Existing	Maintain Existing
Bridge Roadway Width and Vertical Clearance – All Funding Programs	Maintain Existing	Maintain Existing	Maintain Existing

Safety Improvements:

Table 4 presents a list of safety improvements applicable to all roadway functional classifications. Potential crash reduction factors (CRF) are identified along with applicable design references. WYDOT is currently moving to crash modification factors (CMF), and those factors, currently available, are presented. (CMF = 1 - CRF%/100). The WYDOT web site for the Highway Safety Program has the latest listing of CMFs and should be reviewed during development of safety improvement type projects. The CRFs and CMFs presented in Table 4 are intended to be used to evaluate the comparative value of safety improvements for their potential to reduce crash types and rates. These factors can often be additive as multiple safety improvements are combined, but a cumulative CMF cannot exceed 40 percent, and the CRF should be held to the highest value of any one of the combined safety improvements.

Table 4. Safety Improvements and Crash Reduction Factors/CMF

Safety Improvement	CMF	CRF Fatal	CRF Injury	CRF PDO	Design Reference
Install Guide Signs (general)		15%	15%	15%	1
Install Advance Warning Signs (positive guidance)		40%	40%	40%	1
Install chevron signs on horizontal curves	0.90	35%	35%	35%	1
Install curve advance warning signs	0.90	30%	30%	30%	1
Install delineators (general)	0.85	11%	11%	11%	1
Install delineators on bridges		40%	40%	40%	1
Install edge lines & centerlines		0%	45%	0%	1
Install centerline markings		33%	33%	33%	1
Install guardrail at bridge		22%	22%	22%	2
Install guardrail at embankment		0%	42%	0%	2
Install guardrail outside of horizontal curves		63%	63%	0%	2
Improve sight distance to intersection		56%	37%	0%	3
Flatten crest vertical curve		20%	20%	20%	3
Flatten horizontal curve		39%	39%	39%	3
Improve horizontal and vertical alignments		58%	58%	58%	3
Flatten side slopes		43%	43%	43%	3
Improve super-elevation		40%	40%	40%	3
Widen bridge		45%	45%	45%	3
Install shoulder		9%	9%	9%	3
Pave shoulder		15%	15%	15%	3
Install transverse rumble strips on approaches	0.80	35%	35%	35%	3
Improve pavement friction		13%	13%	13%	3
Install animal fencing		80%	80%	80%	3
Install snow fencing		53%	53%	53%	3
Install longitudinal rumble strips	0.84				3
Install Flashing Beacons	0.90				1
Rural left turn lanes	0.60				3

Design References: 1 – FHWA, *Manual on Uniform Traffic Control Devices*
2 – Current safety Design Standards, see Definitions
3 – *Wyoming County Road Fund Manual,* Design Practices, Criteria and Design Values by Project Type and Functional Classification

PROJECT ENVIRONMENTAL DOCUMENTATION and PUBLIC INVOLVEMENT

The design and construction of each of the four project types must comply with applicable state and federal environmental regulations, including public involvement actions. Those projects using state funds or federal funds (FA) or requiring a permit from a federal agency will require completion of an impact assessment and environmental document. The county will need to coordinate with WYDOT representatives to determine the impact assessments (see Appendix 5) and type of document required for compliance with environmental regulations. The environmental document must be completed in advance of right-of-way/ easement acquisition and the bid and award of a construction contract.

New Construction on New Alignment:

Projects constructed with County Road Funds must comply with state and federal environmental and/or permitting requirements when construction is in or adjacent to streams or drainages. Water quality permits may be needed from the U.S. Army Corp of Engineers and the Wyoming Department of Environmental Quality; additional information on these permits is presented in the Drainage section of this Manual. These projects, if located adjacent to federally owned lands, may require coordination and compliance with environmental requirements if additional right-of-way or easements are needed through the federal agency managing those lands.

For projects funded with state funds or federal funds, the county will need to coordinate with WYDOT to determine the type of document required for compliance with environmental regulations. Required environmental documents, typical to this project type, are briefly described as follows:

Environmental Assessment and Finding of No Significant Impact: This document may be required when the analysis of project impacts to environmental resources present in the project area, or coordination with federal and state regulatory agencies, concludes that there will be a substantial adverse impact to protected resources or requires right-of-way acquisition involving substantial relocations or adverse impacts to abutting properties. The analysis and documentation required by an environmental assessment (EA) will require extensive coordination with WYDOT and FHWA and with state and federal regulatory agencies. The analysis should identify all impacts and the efforts made to avoid or minimize impacts, including any proposed mitigation. Public involvement during the development of this project type will follow the WYDOT Operating Policy 17-8, Public Involvement Policy. The EA and finding of no significant impact (FONSI) are completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA.

Categorical Exclusion (Type 3): This document may be used for a project that will require new or additional right-of-way, will require ground disturbance for cuts or fills, and may require work in or adjacent to streams or drainages. Environmental requirements are satisfied when the county completes analysis of project impacts to environmental resources present in the project area and coordination with federal and state regulatory agencies and provides WYDOT with a letter and a copy of any technical reports, presenting the project description and, typically, addressing the following: 1) impacts to water quality and wetlands if the project includes excavation or fill into or adjacent to streams for drainages (proposed work must qualify for a Nationwide 404 Permit by the U.S. Army Corps of Engineers); 2) impacts to threatened or endangered species or habitat if the project includes excavation or fill into or adjacent to streams or drainages; and 3) impacts to cultural resources, including a cultural survey and compliance under Section 106 of the National Historic Preservation Act. Bridge structures also need to be evaluated for historical significance. Each analysis should identify all impacts and the efforts made to avoid or minimize impacts, including any proposed mitigation. Public involvement during the development of this project type will follow WYDOT Operating Policy 17-8, Public Involvement Policy. The categorical exclusion is completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA prior to construction.

Reconstruction on Existing Alignment:

Projects constructed with County Road Funds must comply with state and federal environmental and/or permitting requirements when construction is in or adjacent to streams or drainages. Water quality permits may be needed from the U.S. Army Corp of Engineers and the Wyoming Department of Environmental Quality; additional information on these permits is presented in the Drainage section of this Manual.

These projects, if located adjacent to federally owned lands, may require coordination and compliance with environmental requirements, if additional right-of-way or easements are needed through the federal agency managing those lands.

For projects funded with state and/or federal funds, the county will need to coordinate with WYDOT and FHWA representatives to determine the type of document required for compliance with environmental regulations. Required environmental documents, typical to this project type, are briefly described as follows:

Environmental Assessment and Finding of No Significant Impact: This document may be required when the analysis of project impacts to environmental resources present in the project area, or coordination with federal and state regulatory agencies, concludes that there will be a substantial adverse impact to protected resources or requires right-of-way acquisition involving substantial relocations or adverse impacts to abutting properties. The analysis and documentation required by an environmental

assessment (EA) will require extensive coordination with WYDOT, FHWA, and state and federal regulatory agencies. The analysis should identify all impacts and the efforts made to avoid or minimize impacts, including any proposed mitigation. Public involvement during the development of this project type will follow WYDOT Operating Policy 17-8, Public Involvement Policy. The EA and finding of no significant impact (FONSI) are completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA.

Categorical Exclusion (Type 3): This document may be used for a project that will require new or additional right-of-way, will require ground disturbance for cuts or fills, and may require work in or adjacent to streams or drainages. Environmental requirements are satisfied when the county completes analysis of project impacts to environmental resources present in the project area and coordination with federal and state regulatory agencies and provides WYDOT with a letter and a copy of any technical reports, presenting the project description and, typically, addressing the following: 1) impacts to water quality and wetlands if the project includes excavation or fill into or adjacent to streams for drainages (proposed work must qualify for a Nationwide 404 Permit by the U.S. Army Corps of Engineers); 2) impacts to threatened or endangered species or habitat if the project includes excavation or fill into or adjacent to streams or drainages; and 3) impacts to cultural resources to include a cultural survey and compliance under Section 106 of the National Historic Preservation Act; bridge structures also need to be evaluated for historical significance. Each analysis should identify all impacts and the efforts made to avoid or minimize impacts, including any proposed mitigation. Public involvement during the development of this project type will follow WYDOT Operating Policy 17-8, Public Involvement Policy. The categorical exclusion is completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA prior to construction.

Categorical Exclusion (Type 2): This document is available for a project constructed within existing right-of-way, minimal ground disturbance, and not in proximity to a stream or drainage. Public involvement will follow WYDOT Operating Policy 17-8, Public Involvement Policy. Environmental requirements are satisfied when the sponsor provides WYDOT with a letter presenting the project description followed by "This project is a Programmatic Categorical Exclusion under 23 CFR 771.117 (d)."

Resurfacing and Preservation (Maintenance) on Existing Alignment:

Projects constructed with County Road Funds must comply with state and federal environmental and/or permitting requirements when construction is in or adjacent to streams or drainages. Water quality permits may be needed from the U.S. Army Corp of Engineers and the Wyoming Department of Environmental Quality; additional information on these permits is presented in the Drainage section of this Manual.

These projects, if located adjacent to federal-owned lands, may require coordination and compliance with environmental requirements if additional right-of-way or easements are needed through the federal agency managing those lands.

For projects funded with state and/or federal funds, the county will need to coordinate with WYDOT representatives to determine the type of document required for compliance with environmental regulations. Required environmental documents, typical to this project type, are briefly described as follows:

Categorical Exclusion (Type 3): This document may be used for a project that will require new or additional right-of-way, will require ground disturbance for cuts or fills, and may require work in or adjacent to streams or drainages. Environmental requirements are satisfied when the county completes analysis of project impacts to environmental resources present in the project area and coordination with federal and state regulatory agencies and provides WYDOT with a letter and a copy of any technical reports, presenting the project description and, typically, addressing the following: 1) impacts to water quality and wetlands if the project includes excavation or fill into or adjacent to streams for drainages (proposed work must qualify for a Nationwide 404 Permit by the U.S. Army Corps of Engineers); 2) impacts to threatened or endangered species or habitat if the project, including excavation or fill into or adjacent to streams or drainages; and 3) impacts to cultural resources, including a cultural survey and compliance under Section 106 of the National Historic Preservation Act. Bridge structures also need to be evaluated for historical significance. Each analysis should identify all impacts and the efforts made to avoid or minimize impacts including any proposed mitigation. Public involvement during the development of this project type will follow WYDOT Operating Policy 17-8, Public Involvement Policy. The categorical exclusion is completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA prior to construction. .

Categorical Exclusion (Type 2): This document is available for a project constructed within existing right-of-way, minimal ground disturbance, and not in proximity to a stream or drainage. Public involvement will follow WYDOT Operating Policy 17-8, Public Involvement Policy. Environmental requirements are satisfied when the sponsor provides WYDOT with a letter presenting the project description followed by "This project is a Programmatic Categorical Exclusion under 23 CFR 771.117 (d)."

Safety Improvements:

Projects constructed with County Road Funds must comply with state and federal environmental and/or permitting requirements when construction is in or adjacent to streams or drainages. Water quality permits may be needed from the U.S. Army Corp of Engineers and the Wyoming Department of Environmental Quality. Additional information on these permits is presented in the Drainage section of this Manual.

These projects, if located adjacent to federally owned lands, may require coordination and compliance with environmental requirements if additional right-of-way or easements are needed through the federal agency managing those lands.

For projects funded with state and/or federal funds, the county will need to coordinate with WYDOT representatives to determine the type of document required for compliance with environmental regulations. Required environmental documents, typical to this project type, are briefly described. Design references are from Table 4.

Categorical Exclusion (Type 3): This document may be used for a safety improvement (see **Design Reference 3 (Table 4)**) that will require new or additional right-of-way, will require ground disturbance for cuts or fills, and may require work in or adjacent to streams or drainages. Environmental requirements are satisfied when the county completes analysis of project impacts to environmental resources present in the project area and coordination with federal and state regulatory agencies, and provides WYDOT with a letter and a copy of any technical reports presenting the project description and, typically, addressing the following: 1) impacts to water quality and wetlands if the project includes excavation or fill into or adjacent to streams for drainages (proposed work must qualify for a Nationwide 404 Permit by the U.S. Army Corps of Engineers); 2) impacts to threatened or endangered species or habitat if the project includes excavation or fill into or adjacent to streams or drainages; and 3) impacts to cultural resources, including a cultural survey and compliance under Section 106 of the National Historic Preservation Act. Bridge structures also need to be evaluated for historical significance. Each analysis should identify all impacts and the efforts made to avoid or minimize impacts, including any proposed mitigation. Public involvement during the development of this project type will follow WYDOT Operating Policy 17-8, Public Involvement Policy. The categorical exclusion is completed in advance of easement/right-of-way acquisition and bidding and awarding a construction contract and must be signed by WYDOT and FHWA prior to construction.

Categorical Exclusion (Type 2): This document is available for a safety improvement (see **Design Reference 3 (Table 4)**) that can be constructed within existing right-of-way with minimal ground disturbance and that is not in proximity to a stream or drainage. Public involvement will follow WYDOT Operating Policy 17-8, Public Involvement Policy. Environmental requirements are satisfied when the sponsor provides WYDOT with a

letter presenting the project description followed by "This project is a Programmatic Categorical Exclusion under 23 CFR 771.117 (d)."

Categorical Exclusion Type 1: This document is available for use on safety improvement with a **Design Reference 1 and 2 (Table 4)**, as these project types are all within existing rights-of-way, require minimal ground disturbance, and are not associated with any stream or drainage. For these types of projects, environmental requirements are satisfied when the sponsor provides WYDOT with a letter presenting the project description followed by "This project is a Programmatic Categorical Exclusion under 23 CFR 771.117 (c) or (d)."

ROADSIDE SAFETY

The design and construction of each of the four project types should address roadside safety design elements as part of an overall direction, during project development and delivery, to reduce the frequency and severity of traffic crashes. Highway safety is improved when roadside hazards are removed, relocated farther from the traveled way, modified such as "breakaway" sign mounts, or shielded with guardrail. The recommendations for roadside safety should be considered concurrent with the requirements and recommendations addressed in the Road and Bridge Design Criteria and Design Values, Traffic Control Devices, and Drainage—Pavements, Structures and Facilities sections of this Manual.

New Construction on New Alignment:

This project type should evaluate constructing a clear recovery area (clear zone) adjacent to the roadway. For purposes of this Manual, the recommendations for a clear recovery area will also satisfy requirements for horizontal clearance to obstructions. A clear recovery area is clear of all hazards including trees, rock outcroppings, headwalls, utility poles, and traffic sign supports that do not meet current "breakaway" safety design standards. Recommended clear recovery area widths, measured from the edge of the traveled way, are presented in the *AASHTO Roadside Design Guide* and are based on traffic volumes, speeds, and fore slope and backslope rates. For this project type, a minimum clear recovery area of 10 feet is recommended with minimum 1V:4H fore slope rates.

Roadside safety hardware, including guardrail, bridge rail, and traffic sign supports, if located within the clear recovery area, must meet current safety design standards (see Definitions). For this project type, it is recommended that all safety hardware constructed within the project limits, both within and outside the clear recovery area, meet current safety design standards.

Roadside safety should include implementing construction and maintenance practices that prevent pavement edge drop-off. Drop-offs are the vertical height differences between a paved traveled way and the adjacent shoulder blended material or a paved roadway and the fore slope graded material. Construction practices are available—a shoe mounted on an asphalt paver that shapes the edge of pavement to 30 degrees, eliminating a vertical drop-off. A similar edge should be used for portland cement concrete pavement (PCCP) traveled way or roadway. Maintenance practices should provide for the reshaping of blended aggregate shoulders or graded fore-slopes, as needed to prevent vertical drop-offs.

Reconstruction on Existing Alignment:

This project type should evaluate constructing a clear recovery area (horizontal clearance to obstructions) that is a minimum of 10 feet in width and a minimum of 1V:4H fore slope rates. Recommended widths, typically exceeding the minimum 10 feet, are presented in the *AASHTO Roadside Design Guide* and are based on traffic volumes, speeds, and fore slope and backslope rates.

Roadside safety hardware, including guardrail, bridge rail, and traffic sign supports, if located within the clear recovery area, should be replaced to meet current safety design standards (see Definitions). For this project type, it is recommended that all safety hardware reset or replaced both within and outside the clear recovery area meet current safety design standards.

Roadside safety should include implementing construction and maintenance practices that prevent pavement edge drop-off. Drop-offs are the vertical height differences between a paved traveled way and the adjacent shoulder blended material or a paved roadway and the fore slope graded material. Construction practices are available—a shoe mounted on an asphalt paver that shapes the edge of pavement to 30 degrees, eliminating a vertical drop-off. A similar edge should be used for portland cement concrete pavement (PCCP) traveled way or roadway. Maintenance practices should provide for the reshaping of blended aggregate shoulders or graded fore-slopes, as needed to prevent vertical drop-offs.

Resurfacing and Preservation (Maintenance) on Existing Alignment:

For this project type, all safety hardware removed, reset, or replaced as part of this project must meet current safety design standards (see Definitions). Construction and maintenance practices, discussed above, should be implemented to prevent pavement edge drop-off.

Safety Improvements:

This project type provides funding for a list of safety improvements to construct roadside features, which have a proven record of reducing the frequency or severity of traffic crashes. These safety improvements must meet current safety design standards (see Definitions) and/or the Road and Bridge Design Criteria and Design Values presented in this Manual.

PAVEMENT STRUCTURE AND SURFACE TREATMENT

Pavement design is an important consideration for most project plans.

New Construction on New Alignment and Reconstruction on Existing Alignment:

It is recommended that the pavement structure, including mix design and thicknesses, be selected and documented in the project report using established design procedures and construction practices for New Construction on New Alignment and Reconstruction on Existing Alignment project types, as these projects will require a significant expenditure of funds and are expected to provide satisfactory service through a design life. This recommendation recognizes that either of these project types may be constructed with either a paved or unpaved roadway or traveled way. When the project proposes a pavement surface treatment rather than a pavement structure, that selection process should be documented in the project report.

Resurfacing and Preservation (Maintenance) on Existing Alignment and Safety Improvements:

For these project types, Resurfacing and Preservation (Maintenance) on Existing Alignment and Safety Improvements (those that require improvements to the travel way or roadway surface), it is recommended that the pavement structure or pavement surface treatment be selected and documented in the project report using proven design procedures and construction practices.

All Project Types and all Funding Sources:

The Manual user is advised that Wyoming Statute 31-5-102 and WS 31-5-301 establish a relationship between paved and unpaved roads and a maximum speed limit. WS 31-5-102 defines "paved" as a roadway that is covered by hot-rolled asphalt or concrete but is not constructed solely of recycled asphalt. "Unpaved" is defined as a roadway that is not paved. WS 31-5-301 establishes the maximum speed limit at 65 miles per hour for paved roadways and 55 miles per hour for unpaved roadways. Local authorities, in their respective jurisdictions, may determine that a maximum speed limit that differs from this statute is reasonable and safe.

Paved Roads—have a roadway pavement structure designed for long-term serviceability and can include a paved traveled way with shoulders constructed with blended aggregates.

> **Hot-Rolled Asphalt (Plant Mix Pavement (PMP))—**is a pavement structure consisting of a layer/layers of a hot mixture of an asphalt binder and sized aggregates, each layer compacted to a specified thickness and placed over an aggregate or stabilized base. PMP may also be referred to as Hot Mix Asphalt (HMA).

Concrete (Portland Cement Concrete Pavement (PCCP))—is a pavement structure consisting of a binder paste, portland cement, water, and sized aggregates constructed to a specified thickness and placed over an aggregate or stabilized base.

Recycled Asphalt (RAP)—is in-place PMP that is excavated and pulverized. It is used like an aggregate in the pavement structure, or with heating and addition of a binder it can be compacted to a pavement structure at a specified thickness and placed over a stabilized base. Cold in-place recycling of PMP is another available pavement strategy. Consistent with WS 31-5-102, a paved roadway cannot be constructed solely of recycled asphalt; an asphalt paved roadway can only incorporate a selected percentage of recycled asphalt.

Surface Treatments—involve the application of blended aggregates with an asphalt or cement binder compacted to provide a ride surface for friction, smoothness, drainage, and resistance to rutting. Common surface treatments include chip seals and may be referred to as cover coats or invert penetration. Consistent with WS 31-5-102, a paved roadway cannot be constructed solely with surface treatments; a paved roadway must be constructed with hot-rolled asphalt or concrete.

Unpaved Roads—have a roadway pavement surface that is useable and safe for lower traffic volumes.

Surface Treatment—Binder—involves the application of blended aggregates with an asphalt or cement binder compacted to provide a ride surface for friction, smoothness, drainage, and resistance to rutting. Common surface treatments include chip seals and may be referred to as cover coats or invert penetration.

Surface Treatment—Seal—involves the application of blended aggregates with a magnesium chloride seal and compacted to provide a ride surface for friction, smoothness, drainage, and resistance to rutting.

Surface Treatment—Crushed Stone—involves aggregates crushed to different sizes that are then blended, spread, and compacted across a shaped roadway base. Moisture in the aggregate, along with the fine materials (mineral filler), acts as the binder to hold the material in place.

Surface Treatment—Gravel and Sands—involves aggregates that are readily available and are blended and spread across a shaped roadway base.

DRAINAGE—PAVEMENTS, STRUCTURES, AND FACILITIES

Drainage design elements are an important consideration for all project plans and should be supported with the project area hydrology resulting in a hydraulics analysis and report. A scour analysis (see Definitions) should also be completed. Recommendations for the consideration of drainage facilities to remove water from the roadway and carry water across roadway right-of-way are presented for each project type. The recommendations for drainage should be considered concurrent with the requirements and recommendations addressed in the Pavement Structure and Surface Treatment and Roadside Safety sections of this Manual.

New Construction on New Alignment:

Roadway Cross Slope: The roadway surface cross slope should be selected to ensure adequate drainage of the roadway surface. Paved roadways should be designed with a cross slope rate of 1.5 to 2.0 percent. If greater cross slope rates are used for the paved shoulders than for the traveled way, the cross slope break, especially in areas of super elevation, will need to be checked. Unpaved roadways may need a greater cross slope rate, from 2 to 6 percent, to improve drainage and minimize absorption of water into the surface treatment.

Roadside Drainage: Rural ditch sections—ditches located alongside the roadway in cut sections—should be designed to carry both roadway and adjacent area runoff and of sufficient depth to drain the roadway subgrade. Fore slope rates, ditch shapes, and backslope rates should be selected to accommodate drainage and improve roadside safety. Fore slope rates (minimum 1V:4H), rounded ditch shapes, and traversable (minimum 1V:3H) backslopes are recommended when adequate rights-of-way are available. Urban curb and gutter sections—curb and gutter sections, including storm drain systems—may be necessary in areas of limited rights-of-way.

Bridges, Culverts and Pipe > 20 Feet in Length: This project type provides for the construction of new structures or the full replacement of existing structures. At all stream/drainage crossings, a hydraulics analysis and report is needed to support the hydraulic capacities and selection of a design flood consistent with the county's requirements for maintaining traffic on the roadway, for maintaining a regulatory floodway, and/or for minimizing upstream and downstream property damage. This project type should select a minimum 15-year design flood (see Definitions) for roads functionally classified as collectors and a minimum 10-year design flood for roads functionally classified as local.
Culvert/pipe end treatments, for both cross-drainage and parallel (under intersecting roads and driveways), should be beveled to match the fore slope or protected with a traversable end-section, unless the culvert/pipe end is beyond an established clear recovery area.

Culverts and Pipe ≤ 20 Feet in Length: At all stream/drainage crossings, a hydraulics analysis and report may be needed to support the hydraulic capacities and selection of a design flood consistent with the county's requirements for maintaining traffic on the roadway, for maintaining a regulatory floodway, and/or for minimizing upstream and downstream

property damage. Selection of a minimum design flood to support sizing of culverts and pipes will be based on the above minimums.

Culvert/pipe end treatments, for both cross-drainage and parallel (under intersecting roads and driveways), should be beveled to match the fore slope or protected with an end-section, unless the culvert/pipe end is beyond an established clear recovery area.

Reconstruction on Existing Alignment:

Roadway Cross Slope: The roadway surface cross slope should be selected to ensure adequate drainage of the roadway surface. Paved roadways should be designed with a cross slope rate of 1.5 to 2.0 percent. If greater cross slope rates are use for the shoulders then the traveled way, the cross slope break, especially in areas of super elevation, will need to be checked. Unpaved roadways may need a greater cross slope rate, from 2 to 6 percent, to improve drainage and minimize absorption of water into the surface treatment.

Roadside Drainage: Rural ditch sections—ditches located alongside the roadway in cut sections—should be designed to carry both roadway and adjacent area runoff and of sufficient depth to drain the roadway sub grade. Fore slope rates, ditch shapes, and backslope rates should be selected to accommodate both drainage and improve roadside safety. Fore slope rates (minimum 1V:4H), rounded ditch shapes, and traversable (minimum 1V:3H) backslopes are recommended when adequate rights-of-way are available. Urban curb and gutter sections—curb and gutter sections, including storm-drain systems—may be necessary in areas of limited rights-of-way.

Bridges, Culverts and Pipe > 20 Feet in Length: This project type does not provide for the construction of a new bridge structure or the full replacement of existing structures; work is limited to rehabilitation of existing structures (see Appendix 4). For these existing drainage facilities, a hydraulics analysis and report may be needed to support any proposed structure widening and/or channel modifications or bank protection, consistent with the county's requirements for conveying an existing design flood, maintaining a regulatory floodway, and/or minimizing upstream and downstream property damage. Existing drainage facilities that have a history of frequent flooding which has interrupted traffic service should be evaluated for New Construction on New Alignment.

Culvert/pipe end treatments, for both cross-drainage and parallel (under intersecting roads and driveways), should be beveled to match the fore slope or protected with a traversable end-section, unless the culvert/pipe end is beyond an established clear recovery area.

Culverts and Pipe ≤ 20 Feet in Length: This project type can provide for the new construction or replacement of an existing drainage facility that is ≤ 20 feet in length. For new construction or replacement of facilities at stream/drainage crossings, a hydraulics analysis and report may be needed to support the hydraulic capacities and selection of a design flood consistent with the county's requirements for maintaining traffic on the roadway, for maintaining a regulatory floodway, and/or for minimizing upstream and downstream property

damage. Selection of a minimum design flood to support sizing of new culverts and pipes will be based on the above minimums for New Construction on New Alignment. Existing drainage facilities may be left in place unless there has been frequent flooding that has interrupted traffic service.

Culvert/pipe end treatments, for both cross-drainage and parallel (under intersecting roads and driveways), should be beveled to match the fore slope or protected with an end-section, unless the inlet/outlet is beyond an established clear recovery area.

Resurfacing and Preservation (Maintenance) on Existing Alignment:

Roadway Cross Slope: The roadway surface cross slope should be selected to ensure adequate drainage of the roadway surface. Cross slope rates, as presented above, are recommended for both paved and unpaved roadways, but it is recognized that this type of project may include only shaping of the roadway base, and existing cross slope rates may be retained.

Roadside Drainage: This type of project may include only ditch shaping and pipe (culvert) cleaning with limited or no improvements to the roadside drainage or safety.

Bridges, Culverts and Pipe > 20 Feet in Length: This project type only provides for work needed to extend the service life or make safety improvements to an existing bridge structure. For these existing drainage facilities, a hydraulics analysis and report may be needed to support any proposed channel modifications or bank protection, consistent with the county's requirements for conveying an existing design flood, maintaining a regulatory floodway, and/or minimizing upstream and downstream property damage.

Culverts and Pipe ≤ 20 Feet in Length: This type of project may include only pipe (culvert) cleaning with limited or no improvements to the roadside drainage. Safety improvements could include culvert/pipe end treatments for both cross-drainage and parallel (under intersecting roads and driveways), either beveled to match the fore slope or protected with a traversable end-section.

Safety Improvements:

This project type provides funding for safety improvements that may require modifying existing roadside drainage. For those projects, the recommendations for Reconstruction on Existing Alignment projects are applicable.

PUBLIC RIGHT-OF-WAY

The design and construction of each of the four project types may require that the county establish the existence and description of county-owned public right-of-way. Establishing public right-of-way requires research of county records and either securing or preparing legal descriptions.

W.S. § 24-1-105 establishes a minimum right-of-way width at 60 feet for county roads. For those project types that cannot be constructed within existing right-of-way previously established, the acquisition of private property must provide for the uniform and equitable treatment of all landowners whose property is acquired for public use. Acquisition is defined as the process of acquiring real property or an interest (partial acquisition or easement) in that property. Once the county identifies the need and legal description of additional right-of-way, acquisition will follow general steps, which include property appraisal with initial contact with the property owner; determination of fair market value for the property or interest; negotiation leading to a written offer of compensation, including contact with the property owner to explain the acquisition process; an agreement to purchase or acquire by easement the property supported by legal description; and payment for the property or interest.

If federal funds and/or state funds are used, the county is to follow the procedures required by the Uniform Relocation Assistance and Real Property Act, required by 49 CFR Part 24. It is recommended that these procedures be followed in all acquisitions. When an agreement with the landowner cannot be reached through negotiations, the county will need to pursue the acquisition of the property through County Road Establishment procedures as outlined in Wyoming Statutes Title 24, Chapter 3 or through Eminent Domain as allowed under Title 1, Chapter 26.

Those projects using state funds (SA) and/or federal funds (FA) will require a certification statement that all right-of-way needed to construct the proposed project is county-owned (public ownership). This certification is completed in advance of bidding and awarding a construction contract.

A representative Right-of-Way Certificate is presented in Appendix 6.

UTILITY ACCOMMODATION

The design and construction of each of the four project types may require that the county adjust or relocate utilities that occupy public right-of-way under county jurisdiction. Preliminary engineering, for all project types, may require locating public and privately owned utilities within the public right-of-way, including overhead facilities and the horizontal and vertical location of sub-surface utilities. These utility locates are needed to ensure that construction of the project does not require the adjustment or relocation of existing utilities or that these adjustments and relocations are either completed prior to construction or are incorporated in the contract plans as biddable contract work.

Those projects using state funds (SA) and/or federal funds (FA) require a certification statement that all utility adjustments or relocations needed to construct the proposed project have been completed or are included in the project's contract plans as biddable work. This certification is completed in advance of bidding and awarding a construction contract.

A representative Utility Certificate is presented in Appendix 6.

TRAFFIC CONTROL DEVICES

Traffic control devices, including traffic signs, pavement markings, delineators, and intersection traffic control, signalized and non-signalized, should be considered with each of the four project types to provide for motorist guidance, improved traffic operations, and roadway safety. These requirements and recommendations for traffic control devices should be considered concurrent with the requirements and recommendations addressed in the Road and Bridge Design Criteria and Design Values and Roadside Safety sections of this Manual.

New Construction on New Alignment:

This project type, regardless of funding source, must provide for traffic signs, pavement markings if it is a paved roadway, delineators, and intersection traffic control. These devices must meet *Manual on Uniform Traffic Control Devices (MUTCD)* standards and adherence to MUTCD guidance is also recommended.

Reconstruction on Existing Alignment:

This project type, regardless of funding source, must provide for traffic signs, pavement markings if it is a paved roadway, delineators, and intersection traffic control. These devices must meet *Manual on Uniform Traffic Control Devices (MUTCD)* standards and adherence to MUTCD guidance is also recommended.

Resurfacing and Preservation (Maintenance) on Existing Alignment:

This project type typically can be constructed without the removal, reset, or replacement of existing traffic control devices. It is recommended that traffic signs, pavement markings if it is a paved roadway, delineators, and intersection traffic control devices be inspected. Those devices, especially regulatory signs and warning signs, that no longer meet the *Manual on Uniform Traffic Control Devices (MUTCD)* standards and guidance should be repaired or replaced with this project type.

Safety Improvements:

This project type provides funding for the installation of traffic signs, pavement markings if it is a paved roadway, delineators, and intersection traffic control devices. These devices must meet *Manual on Uniform Traffic Control Devices (MUTCD)* standards and adherence to MUTCD guidance is also recommended.

OTHER DESIGN ELEMENTS

There are numerous design elements to be considered during project development. The recommendations for these Other Design Elements should be considered concurrent with the requirements and recommendations addressed in Road and Bridge Design Criteria and Design Values, Project Report, Roadside Safety and Project Environmental Documentation.

Surveys: Surveys for terrain, land ownership, construction surveying/staking, and as-constructed survey and recordation may be needed for project development and construction. These surveys should be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional land surveyor. Terrain surveys and construction surveying/staking can be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional engineer.

Geotechnical Engineering: Geotechnical investigations and reporting are recommended for soils sampling/soil profile to support the design of a pavement structure, foundation and design criteria for bridges and other major structures, and foundation and design criteria for other structures, including drainage and retaining walls but are not needed for walls such as modular block walls for landscaping. Geotechnical surveys and reports should be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional geologist or a Wyoming-registered professional engineer.

Earthwork and Subgrade: A major design element is the development of plans and specifications for the removal and placement of earthwork to construct the planned earth grade cross section through the subgrade needed to support the pavement structure. Typical construction practice is to excavate earth materials and replace them with suitable materials with both moisture and density (compaction) controls to provide a stable roadway foundation. Additional earthwork and materials are needed to provide for recommended roadside safety.

Intersections: Intersection design should recognize that an intersection location is a driver decision point and is often a likely location for vehicle-vehicle crashes. The operational work category for each of the project types proposes improvements to all intersection legs to serve and delineate traffic movements. Improved intersection design should also provide for 90 degree alignment of the intersecting road, provide separate left- and right-turn lanes, provide sight distance consistent with the design speed of the major roadway, and provide traffic control devices in accordance with the MUTCD.

Material Sources: Construction contracts may require that the contractor furnish all materials to be incorporated in the required contract work. Earthwork and aggregates (natural materials) used for the pavement structure or surface treatment will be obtained from sources generally stated as "contractor furnished," "available sources," or "commercial sources." These sources, other than commercial, should be evaluated with material sampling to support use in construction of earthwork or the pavement structure or surface treatment. Additionally, these

sources, other than commercial, may require clearance during environmental documentation and be seen as "site of work" requiring compliance with state or federal pre-determined wage rates.

Water Sources: The county should determine if it will take responsibility for obtaining the rights to a water source for the amount of water needed to construct the project, such as grading operations, including any pre-wetting, crushing and plant sites, dust control, topsoil, or landscaping. Water sources secured by the county should be by agreement to supply the needed quantities and should address any other right holders and priorities. Coordination with the State Engineers Office may be needed.

Water Quality Permits and Permitting Conditions: The Wyoming Department of Environmental Quality (DEQ) issues Storm Water Permits**,** which may be required prior to construction. The DEQ should be consulted to assure compliance with permitting requirements. Permit types are based on acreage of disturbance, and the type of permit and permitting conditions will follow consultation with the DEQ.

The U.S. Army Corps of Engineers (COE) issues 404 permits, permitting the dredge or fill of materials into waters of the United States. Both individual and nationwide permits are used, depending on the project type and the level of environmental documentation. Generally, a Nationwide Permit 14 can be used for roadway projects that impact ≤ ½ acre of water of the U.S.; Nationwide Permit 23 can be used for projects using categorical exclusion (CE) environmental documentation. An individual permit is typically used for projects using environmental assessment (EA) environmental documentation and for any project that does not meet the criteria of a nationwide permit. Each of these permits has a series of criteria for its use, and the COE should be consulted to ensure compliance with permitting requirements.

Siltation and Erosion Control Plans:

Storm water permits, issued by the DEQ, will typically require that the county ensure the development of a Storm Water Pollution Prevention Plan (SWPPP) for inclusion in contract plans. The SWPPP is a plan, specific to the construction site that describes "best management practices" that will be used to keep pollutants on site and out of adjacent surface waters and wetlands.

Traffic Control Plans: Temporary traffic control during the construction of each of the four project types and when construction is on or adjacent to any public road will need to be in conformance with the *Manual on Uniform Traffic Control Devices*. Temporary traffic control should provide for the safe and efficient movement of road users through and around construction areas while protecting workers; this can be accomplished with site specific traffic control plans or the use of applicable standard plans.

PROJECT REPORT

It is recommended that a project report be prepared for two project types: New Construction on New Alignment and Reconstruction on Existing Alignment, as these projects will require a significant expenditure of funds, are expected to provide satisfactory service through a design life, and must meet the design values for each design criteria presented in this Manual and other Manual provisions.

A brief and concise project report is recommended for the remaining two project types: Resurfacing and Preservation (Maintenance) on Existing Alignment and Safety Improvements. The recommended report content for each project type follows:

New Construction on New Alignment and Reconstruction on Existing Alignment
(Level of documentation is dependent on project type and project description.)

The selection of these two project types will be supported by a brief summary for each of the following project components, consistent with the requirements of this Manual and identifying additional studies needed to support project decisions.

☐ Project Planning Deliverables – Selection of Project Type and Project Description.

☐ Road and Bridge, Design Criteria and Design Values: From this Manual.
Design Exceptions.

☐ Survey and Mapping: Terrain, Land Ownership, Construction, Recordation.

☐ Earthwork Design.

☐ Environmental Resource Inventory and Document Type.
Wetlands.
Floodplains.
Cultural – Historic and Archaeological.
Threatened and Endangered Species and Wildlife.
Hazardous Materials.
Wildlife Movement and Habitat – Needed if project requires right-of-way or is adjacent to federal or state-owned land.
Section (4f) Evaluation.
An Environmental Impact Evaluation, Appendix 5, provides a comprehensive listing of resources that may require analysis/impact evaluation.

☐ Roadside Safety:
Clear Recovery Area.
Fore-slope rates.
Safety Hardware.

☐ Pavement Structure or Surface Treatment Selection and Design:
- Design Year Traffic and ESAL Conversion.
- Geotechnical Investigations.
- Existing base and pavement surface analysis, including thicknesses.
- Drainage Investigations.
- Material Sources – Locally Available.
- Established Design Procedure.

☐ Drainage Structures and Facilities
- Roadway Cross-Slope.
- Roadside Drainage.
- Project area hydrology resulting in a hydraulics analysis and report and scour analysis.
- Geotechnical Foundation Investigations.
- Bridges, Culverts and Pipe ≥ 20 Feet in Length.
  - Drainage: Type, Size, Location, Design Vehicle, Design Specification.
  - Highway or Railroad Overpass/Underpass: Type, Size, Location, Design Vehicle, Design Specification.
- Culverts and Pipe < 20 Feet in Length: Type, Size, Location.
- Safety Considerations.

☐ Project Right-of-Way:
- Acquisitions and Relocations.
- Certificate.

☐ Utility Considerations:
- Survey.
- Relocations or Accommodations.
- Certificate.

☐ Traffic Control Devices.
- Permanent Signing and Delineation Design.
- Pavement Striping Design.
- Intersection Design.

☐ Other Design Elements .
- Material Sources – Agreements with landowner, private or public.
- Water Sources – Agreements with landowner, private or public.
- Water Quality Permits and required Plans.
- Traffic Control Plans.

☐ Project Planning Deliverables – Funding Plan:
Funding Program – Total Funds Available and County Share of Cost.
Availability of Funds (Year of Construction).

☐ Funding Agency Requirements:
Cooperative (Project) Agreements.
Environmental Documentation.
Right-of-Way and Utility Certificates.
Contract Documents.
Project Bidding and Award of Contract.
Construction and Contract Administration.
Maintenance and Remain-in-Service.

☐ Deviations from the requirements and recommendations of this Manual.

The project report will document each of the above, when relevant to the proposed work categories, pavements, bridge, safety, and operational improvements. A preliminary project report should be prepared to guide preliminary design (see Plan Development and Contracting Requirements), and a final project report should be prepared, following preliminary engineering, to guide final engineering. The final project report should be reviewed and accepted by a Wyoming-registered professional engineer.

Resurfacing and Preservation (Maintenance) on Existing Alignment, and Safety Improvements:

The selection of these two project types will be supported by a brief preliminary and/or final project report that summarizes each of the above project components, as applicable and consistent with the requirements of this Manual. The final project report will support project decisions and should be reviewed and accepted by a Wyoming-registered professional engineer.

PLAN DEVELOPMENT AND CONTRACTING PROVISONS

Plan development recommendations are provided for each of the four project types to establish a systematic approach to the issuance of varying levels of plan development. These levels are often referred to as 35 - 90 percent plans, resulting in the completion of contract documents.

Contracting provisions are those contracting requirements incorporated into contract documents that are inherent to the contract work but are not biddable items of work. The following requirements and recommendations must be addressed concurrent with the requirements and recommendations in the Contract Documents—Plans and Specifications section of this Manual.

Plan Development for New Construction on New Alignment and Reconstruction on Existing Alignment:

Development of these two project types, requiring a significant expenditure of funds, should be supported with both preliminary design functions and final design functions. Preliminary plans should be developed to address each of the project components listed in the project report, including support for any design exceptions, completion of environmental documents, and estimated work quantities.

Final design, leading to contract documents, should finalize project components from the project report, finalize utility accommodation and acquisition of right-of-way or easements, finalize work quantities and an engineer's estimate of project costs, and produce final plans, specifications, and contracting provisions.

Interim plan sets are recommended for complex projects to assure that project components are fully addressed, presented, and accepted.

Addendums are those revisions to Contract Documents that are developed and issued after public advertisement for receipt of bids. All addendums should be finalized and issued to all prospective bidders in sufficient time to be addressed during contract bid and prior to contract award.

Plan Development for Resurfacing and Preservation (Maintenance) on Existing Alignment, and Safety Improvements:

Development of these two project types will generally follow an abbreviated plan development process that addresses each of the project components from the project report.

A preliminary and final design function should be used if the project requires design exceptions (project construction will result in the reduction of existing lane or shoulder widths), requires an environmental assessment, or requires the acquisition of right-of-way. Otherwise, each project type will require final design functions leading to contract documents, including final plans, specifications, and contracting provisions.

Contracting Provisions for All Project Types, by Funding Source:

County Road Fund Project Contracting Provisions

Provision	Description	Reference
*Advertisement (Invitation) to Bid	Project information.	County
Bidder Preference: In-State 5% bidder preference will be used.	Certified resident's bid is not more than five percent (5%) higher than that of the lowest responsible nonresident bidder.	W.S. 16-6-102
Resident Labor	Employ Wyoming laborers.	W.S. 16-6-203
Wage Compliance	Incorporate provisions of Wyoming Prevailing Wage Act of 1967.	W.S. 27-4-401 through W.S. 27-4-413
Quantity Summaries and Bid Units of Work	Often referred to as a Bid Schedule or Total Estimated Quantities (TEQ).	Contract Documents
General Conditions	A list of general contract conditions (provisions) should be developed and maintained by each county: Delivery of Bonds and Insurance, Notice to Proceed, Contractor's Responsibilities, Owner's Responsibilities during Construction, Changes in Work, Contract Time, and/or Contract Cost, Payments and Completion, Suspension or Termination of Work.	General Conditions of the Construction Contract
Supplementary Conditions	A list of supplementary contract conditions (provisions) should be developed and maintained by each county, specific to the project.	Supplementary Conditions of the Construction Contract

*These are not contracting provisions, but are required contract-related documents.

State-Funded Project Contracting Provisions

Provision	Description	Reference
Supervising Agency (Note, this is required but is not a contract-related document)	A full-time employee of the county must be in responsible charge of the project, including those services performed by agreement with consultant firms.	Standard Practice
Qualification of Construction Contractors	Requirements for bonding, insurance, licensing, or pre-qualification (no requirement can be used if such use would restrict competition or disallow submission of a responsive bid).	Standard Practice
Bidder Preference: In-State 5% bidder preference will be used.	Certified resident's bid is not more than five percent (5%) higher than that of the lowest responsible nonresident bidder.	W.S. 16-6-102
*Invitation to Bid	Project information.	WYDOT
Competitive Bidding Reserved to Private Construction Contractors	Contract work must be performed by private construction contractors (not by a public agency including subcontracting).	Standard Practice
Contract Time	The county must have procedures for determining contract time.	Standard Practice
Required Contract Provisions	Application and Definitions. Employment Provisions. Subletting or Assigning the Contract. Safety and Accident Prevention.	ST-4 Supplementary Document
Resident Labor	Employ Wyoming laborers.	W.S. 16-6-203
Wage Compliance	Incorporate provisions of Wyoming Prevailing Wage Act of 1967.	W.S. 27-4-401 through W.S. 27-4-413
Programmed Funds	Limits overrun of programmed funds, adjusts project for under-run of funds.	ST-3 Supplementary Document
Method of Measurement and Basis of Payment	Contract documents must provide for the accurate measurement of quantities of completed work as the basis for payment.	Standard Practice
Extra Work and Change Orders	Contract clause providing definition and execution of extra work and contract time.	Standard Practice
Acceptance of Contract Work	The county must final accept all contract work, and contract documents should identify the point and method of acceptance.	Certificate, see Appendix 7

*These are not contracting provisions, but are required contract-related documents.

Federally Funded Project Contracting Provisions

Provision	Brief Description	Reference
Supervising Agency (Note, this is required but is not a contract-related document)	A full-time employee of the county must be in responsible charge of the project, including those services performed by agreement with consultant firms.	23 CFR 635
Qualification of Construction Contractors	Requirements for bonding, insurance, licensing, or pre-qualification (no requirement can be used if such use would restrict competition or disallow submission of a responsive bid).	23 CFR 635
*Invitation to Bid	Project information.	WYDOT
Bidder Preference (In-State 5% preference is not allowed)	Award to lowest responsive bidder; an In-State Preference is not allowed.	23 CFR 635
Competitive Bidding Reserved to Private Construction Contractors	Contract work must be performed by private construction contractors (not by a public agency including subcontracting).	23 CFR 635
Contract Time	The county must have procedures for determining contract time.	23 CFR 635
FHWA-1273, Required Contract Provisions	Prohibits Hiring Preferences and Convict Labor (partial). Prohibits discrimination, including facilities; Predetermined Minimum wages (Davis-Bacon). Requires Certified Payrolls. Limits subcontracting. Requires construction safety standards. Prohibits false statements/fraud. Implements federal clean air and water quality legislation. Requires certifications for debarment and lobbying.	23 CFR 633 Form FHWA-1273 must be incorporated (not by reference) into the contract documents. Current form is dated 1973 (electronic version dated March 10, 1994).
**Job Site Posters	A job site bulletin board must be in place with a series of required posters.	**See Below
Contractor-Provided Labor (Also applies to subcontractors)	Contract documents cannot require any state or local hiring preferences (except as noted for Indian Employment Preference).	23 CFR 635
Contractor-Provided Materials (Also applies to subcontractors)	Contract documents will require that the private construction contractor furnish all materials needed to complete contract work.	23 CFR 635
Patented/Proprietary Materials and Products	Materials and products to be incorporated into the project should be described using generic specifications. Trades names or brand names can be listed only if the material or product cannot be generically specified; at least three equal materials or products are to be listed.	23 CFR 635

Contractor-Provided Equipment (Also applies to subcontractors)	Contract Documents will require that the private construction contractor furnish all equipment needed to complete contract work.	23 CFR 635
Method of Measurement and Basis of Payment	Contract documents must provide for the accurate measurement of quantities of completed work as the basis for payment.	23 CFR 635
Force Account - payment for the direct performance of work based on labor, materials, and equipment	The use of force account should only be used for work that cannot be clearly defined or accurately estimated in the original contract documents.	23 CFR 635
Buy America Contract Clause	All iron and steel products, including coatings, must be supplied, including the manufacturing process, from within the United States.	23 CFR 635
Disadvantaged Business Enterprise (DBE)	Contract documents must ensure that those DBE firms, certified by WYDOT, have an opportunity to participate, typically by subcontract, in contract work.	49 CFR 26
Contractor Compliance – opportunities for females and minorities in contractor workforce	Required Special Provision.	23 CFR 230, Appendix A
Indian Employment Preference	An Indian Employment Preference is allowed in contracts for projects located on roads on or near Indian reservations. May apply to the Wind River Indian Reservation and the Crow Indian Reservation (southern Montana at Wyoming state line).	23 CFR 635
Tribal Employment Rights Office (TERO) Tax.	A TERO tax is allowed in contracts for projects located on an Indian reservation. May apply to the Wind River Reservation.	23 CFR 635
Non-collusion Statement	A non-collusion statement is required from all bidders; failure to certify results in non-responsive bid (ineligible for contract award).	23 CFR 635
Lobbying Certification	A lobby (no prohibited payments) certification is required from all bidders.	49 CFR 20
Suspension or Debarment Certification	A suspension and debarment certification is required from all bidders.	49 CFR 20
Changed Condition Contract Clauses	The standardized changed condition clauses, in 23 CFR 109, must be included, verbatim, in all contract documents.	23 CFR 635
Prompt Payment Clause for satisfactory performance of work and retainage	Contract clause requiring prime contractor to pay subcontractors within 30 days of receipt of payment from county, for all satisfactory subcontract work performed, and retainage.	49 CFR 26
Extra Work and Change Orders	Contract clause providing definition and execution of extra work and contract time.	23 CFR 635

Warranty or Guaranty Clause	Warranty or guaranty clauses are not allowed for any work item that would be defined as future routine maintenance. Warranty or guaranty clauses are allowed as the basis for acceptance of work and workmanship during the terms of the contract. Landscape establishment periods, beyond contract time, are acceptable.	23 CFR 635
Acceptance of Contract Work Materials Certification	The county must final accept all contract work and materials; Contract documents must identify the point and method of acceptance.	Certificate, see Appendix 7

*These are not contracting provisions, but are required contract-related documents.

** A board of required job posters must be available on-site. A listing of posters, and reproducible copies, is at http://www.dot.state.wy.us/wydot/business_with_wydot/civil_rights.

CONTRACT DOCUMENTS—PLANS AND SPECIFICATIONS

Contract documents are those plans, specifications, and contracting provisions developed to describe, in detail, all work (labor, materials, equipment) needed to complete a project and are made available at time of the public advertisement for contract bids. They are often referred to as PS&E (Plans, Specifications, & Estimate). These documents also include the agreement (contract) between the county and the contractor, specifying other contractual requirements, including the completion date/contract time, bid and payment and performance bonds, and certifications.

The requirements and recommendations for the Contract Documents—Plans and Specifications section are a summary of the requirements and recommendations of all other project development sections of this Manual.

New Construction on New Alignment and Reconstruction on Existing Alignment:

Contract documents include all detailed plan sheets, specifications, and required contracting provisions. Detailed plan sheets can include title sheets, plan and profile sheets, typical sections, quantity summaries, specific detail sheets, pit layout, soils profile, earthworks, cross-sections, and standard plans. Specifications can include standard, supplementary, and special specifications. Contracting provisions are presented in this Manual. Contract plans and specifications must, at a minimum, identify bid units (quantity summaries) with method of measurement and basis of payment and include specifications that identify the method of acceptance of all materials incorporated in the project. Acceptance can be by certifications, sampling and testing, in-place measurements, and inspections.

Specifications are used by both the county and the construction contractor to establish the contract work to be performed, conditions or restrictions on work performance, the method of measurement and basis of payment of work performed, and the quality or basis of acceptance for all materials incorporated and all work performed. Specifications, including standard specifications, supplementary specifications, and special provisions, are contractual documents and should be written clearly and concisely using a standard format. The most common format uses five major divisions: Description, Materials (including sampling and testing for acceptance), Equipment, Construction Requirements, and Measurement and Payment.

An estimate of project cost, referred to as an engineer's estimate (EE), is developed based on contract plan quantity summaries. The intent of an EE is to establish the monetary value of the project to the county. The EE should consider numerous factors, including bid item cost history, current market price and price trends, project size and location, work type, and specialty work required. Project costs are determined using bid items, as required by the quantity summaries, their units of measurement and payment, and their planned quantities, resulting in an estimate of bid item costs that are extended to arrive at the project cost. The EE

is retained by the county and is not made available as part of contract documents during contract bidding.

The required contracting provisions outlined in this Manual must be incorporated into contract documents and made part of the contractual agreement.

Contract documents must be complete, and a standardized listing of all inclusions is beyond the scope of this Manual. Generally, contract documents will include the following:

- Agreement between the county and the contractor.
- General and supplementary conditions.
- Detailed plan sheets & drawings.
- Standard specifications, supplementary specifications, and special provisions.
- Contracting provisions.

Additional documents are typically used to complete the bid proposal made available for the public advertisement and receipt of bids as outlined in the Contract Bid and Project Award section of this Manual. These documents may include the following:

- Advertisement for bids (Invitation to Bid).
- Instruction to bidders.
- Bonding requirements—bidding, payment, and contract performance.
- Notice of Award and Notice to Proceed.
- Addendums (see Plan Development and Contracting Provisions section).
- Supporting documentation for extra work change orders.

For these projects, it is recommended that the contract documents either be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional engineer or be reviewed and accepted by a Wyoming-registered professional engineer.

Resurfacing and Preservation (Maintenance) on Existing Alignment, and Safety Improvements:

A complete set of contract documents, including all required contracting provisions, are needed prior to advertisement for bids.

Contract plans and specifications must, at a minimum, identify bid units (quantity summaries) with method of measurement and basis of payment and include specifications that identify the method of acceptance of all materials incorporated in the project. Acceptance can be by certifications, sampling and testing, in-place measurements, and inspections. These bid units and quantities are supported by any needed plans and specifications described above. An engineer's estimate should be developed and retained by the county as it is not made available as part of contract documents during contract bidding.

CONTRACT BID AND PROJECT AWARD

The contract bid and project award will be completed by the county or by WYDOT. The requirements and recommendations for contract bid and project award should be considered concurrent with the requirements and recommendations in the Project Development and Contracting Provisions and Contract Documents—Plans and Specifications section of this Manual.

Public Advertisement:

County Road Fund Projects: Contract bidding will follow accepted local government bidding procedures for open and public competitive bidding. Statute requires that the board of county commissioners of any county will ensure that notices for contract bidding, when the estimated cost of the project exceeds $50,000.00 or $25,000.00 for a bridge project (construction or reconstruction/rehabilitation), be published for two consecutive weeks in a newspaper having general circulation within the state and to take any other means available to achieve as wide a notice as possible, but in no case will any letting (public reading of bids or project award) of the contract be held within 15 days of the last published notice (W.S. 24-1-132). A contract cannot be divided for the purpose of avoiding public advertisement and competitive bidding.

The construction work may be described in the published call for bids by stating general requirements, and contract plans and specifications will be available to prospective bidders. Projects with an estimated cost at or less than the $50,000.00 and $25,000.00 limits noted above, or projects to restore the use of roadways under emergency, can be constructed with a negotiated contract.

State-Funded and Federally Funded Projects: Those projects that are administered by the county by cooperative agreement with WYDOT will follow accepted local government bidding procedures, except all projects regardless of estimated cost will follow procedures for open and public competitive bidding. Those projects that WYDOT retains for engineering and construction will follow WYDOT procedures, and an invitation to bid will be published in one newspaper with a general circulation that is statewide. (WYDOT uses the Casper Star-Tribune). The advertisement will generally appear once a week for three consecutive weeks with a period of one week between the last advertisement and the bid opening. At WYDOT's discretion, a two-week advertisement period may be used for small, relatively simple projects or when there is some urgency to place the project under contract.

Competitive Bid:

County Road Fund Projects: Construction will typically be performed by private construction firms.

State and Federally Funded Projects: Those projects that are administered by the county, by cooperative agreement with WYDOT, will follow accepted local government requirements for competitive bids. Construction will typically be performed by private construction firms. Those projects that WYDOT retains for engineering and construction will follow WYDOT procedures (see Section 102 of the Wyoming *Standard Specifications for Road and Bridge Construction, 2010 Edition*.)

Bid Analysis:

An engineer's estimate (EE) will be available to the county for use in analyzing contractor bids received in response to public advertisement. A contractor's unit bid should reflect the reasonable actual cost for completing the work plus a reasonable share of anticipated profit, overhead, and other indirect costs associated with highway construction. Bid analysis compares contractor unit bid prices against the EE for unusually high or low prices. A contractor's unusually high or low prices may reflect an unbalanced bid or be an indicator of an inaccurate estimate of planned quantities. The end result of bid analysis is to conclude that the contractor's bid, if determined to be the lowest responsible bidder, will deliver the project at the lowest cost to the county.

Project Award:

County Road Fund Projects and State-Funded Projects: Statute requires that all contracts be awarded to the lowest responsible bidder, consistent with Wyoming Statute 16-6-102. That statute provides that the contract shall be let to a responsible certified resident making the lowest bid if the certified resident's bid is not more than 5 percent higher than that of the lowest responsible nonresident bidder. Project award by the Board of County Commissioners is a required administrative action and requires concurrence from WYDOT for state-funded projects.

The county commissioners do reserve the right to reject any and all bids and to waive irregularities and informalities in the bidding.

Federally Funded Projects: All contracts must be awarded to the lowest responsible bidder. Wyoming Statute 16-6-102 does not apply to federally funded projects. Project award by the Board of County Commissioners is a required administrative action and requires concurrence from WYDOT for federally funded projects.

The county commissioners do reserve the right to reject any and all bids and to waive irregularities and informalities in the bidding.

CONSTRUCTION & CONSTRUCTION ENGINEERING

Each of the four project types, for all funding sources, will typically be constructed with work performed by a private construction firm by contractual agreement with the County. Construction Engineering and Contract Administration, for the project, will be performed by or under the immediate direction, control, and supervision of the County. The requirements and recommendations for Construction and Construction Engineering should be addressed concurrent with the requirements and recommendations in the Contract Documents—Plans and Specifications section of this Manual.

Project Construction: Construction of the project will be completed in accordance with the contract documents and approved addendums (see Plan Development and Contracting Provisions). During construction, extra work change orders (contract modifications) may be needed and are approved written changes to contract documents, including contract time and needed extra work that is within the intended scope of the contract documents but beyond or varying from that provided in the original contract documents and addendums. All extra work change orders must be within the established project limits and project funding limitations.

Construction Engineering: Construction engineering generally addresses each of the following activities in substantial conformance with contract documents and as required by the funding agency:

- Pre-construction conference.
- Records and documentation.
- Job-site bulletin board/job posters.
- Working relationship between county and contractor.
- Acceptance of contract work, determined satisfactory:
    - Certifications—from material's supplier, when required.
    - In-Place Measurement—field measurement or plan quantity.
    - Inspection—from general or supplementary conditions or specifications.
    - Sampling and Testing—in accordance with specifications and including quality control and assurance.
- Contractor compliance with water quality permits and permit conditions.
- Contractor progress and progress payments for accepted contract work.
- Extra work change orders (contract modifications) and documentation.
- Project inspections.
- Public safety—road users and pedestrians—through the project.
- Complaint resolution—supplier, contractor (employees), and public.
- Claim avoidance or claim documentation and resolution.
- Final inspection and final acceptance.
- As-built plans, as needed.
- Bridge construction projects—inspection and approval by designer and county prior to contractor final payment, W.S. 24-2-106.

- Final settlement and payment to contractor; required notices, W.S.16-6-116.
- Final contractor payment.
- Project financial accounting.

Contract Administration:

Administration of Contracting Provisions, for All Project Types by Funding Source, is presented in the following tables, using the following methods:

Verification—Contract Documents and/or Contract Bid and Award will be completed through development of a completed package of contract documents prior to construction;

Verification—Construction requires periodic actions (construction engineering) and must be recorded in the project's records and documentation.

Receipt requires taking possession and must be retained as project records and documentation throughout project construction. No additional contract administration is required.

Complaint Resolution requires that a complaint received during project construction, supplier, contractor (employees), and public must be satisfactorily resolved and must be retained as project records and documentation; coordination with WYDOT is recommended. No additional contract administration is required.

County Road Fund Project Contracting Provisions

Provision	Description	Contract Administration
Advertisement (Invitation) to Bid	Project information.	County Administrative Requirements—for the selected methods
Bidder Preference: In-State 5% bidder preference will be used.	Certified resident's bid is not more than five percent (5%) higher than that of the lowest responsible nonresident bidder.	County Administrative Requirements—for the selected methods
Resident Labor	W.S. 16-6-203	County Administrative Requirements—for the selected methods
Wage Compliance	W.S. 27-4-401 through W.S. 27-4-413	County Administrative Requirements—for the selected methods
Quantity Summaries and Bid Units of Work	Often referred to as Total Estimated Quantities (TEQ).	County Administrative Requirements—for the selected methods
General Conditions	A listing of general contract conditions (provisions) should be developed and maintained by each county: Delivery of Bonds and Insurance, Notice to Proceed, Contractor's Responsibilities, Owner's Responsibilities during Construction; Changes in Work, Contract Time, and/or Contract Cost; Payments and Completion, Suspension or Termination of Work.	County Administrative Requirements—for the selected methods
Supplementary Conditions	A listing of supplementary contract conditions (provisions) should be developed and maintained by each County, specific to the Project.	County Administrative Requirements—for the selected methods

State-Funded Project Contracting Provisions

Provision	Description	Contract Administration
Supervising Agency	A full-time employee of the county must be in responsible charge of the project, including those services performed by agreement with consultant firms.	Verification - Construction
Qualification of Construction Contractors	Requirements for bonding, insurance, licensing, or pre-qualification (no requirement can be used if such use would restrict competition or disallow submission of a responsive bid).	Verification - Contract Documents and Contract Bid and Award
Bidder Preference: In-State 5% bidder preference will be used.	Certified resident's bid is not more than 5% higher than that of the lowest responsible nonresident bidder.	Verification - Contract Documents and Contract Bid and Award
Invitation to Bid	Project information.	NA
Competitive Bidding Reserved to Private Construction Contractors	Contract work must be performed by private construction contractors (not by a public agency including subcontracting).	Verification - Contract Documents and Contract Bid and Award

Contract Time	The county must have procedures for determining contract time.	Verification - Contract Documents and Contract Bid and Award
Required Contract Provisions	Application and Definitions. Employment Provisions. Subletting or Assigning the Contract. Safety and Accident Prevention.	Complaint Resolution Complaint Resolution Verification - Construction Complaint Resolution
Resident Labor	W.S. 16-6-203	Complaint Resolution
Wage Compliance	W.S. 27-4-401 through W.S. 27-4-413	Complaint Resolution
Programmed Funds	Limits overrun of programmed funds, adjusts project for under-run of funds.	Verification - Contract Documents and Contract Bid and Award
Method of Measurement and Basis of Payment; Extra Work - Change Orders	Contract documents must provide for the accurate measurement of quantities of completed work as the basis for payment.	Verification - Construction
Acceptance of Contract Work	The county must final accept all contract work, and contract documents should identify the point and method of acceptance.	Verification - Construction

Federally Funded Project Contracting Provisions

Provision	Brief Description	Contract Administration
Supervising Agency	A full-time employee of the county must be in responsible charge of the project, including those services performed by agreement with consultant firms.	Verification - Construction
Qualification of Construction Contractors	Requirements for bonding, insurance, licensing, or pre-qualification (no requirement can be used if such use would restrict competition or disallow submission of a responsive bid).	Verification - Contract Documents and Contract Bid and Award
Invitation to Bid	Project information.	NA
Bidder Preference (In-State 5% preference is not allowed)	Award to lowest responsive bidder; an In-State Preference is not allowed.	Verification - Contract Documents and Contract Bid and Award
Competitive Bidding Reserved to Private Construction Contractors	Contract work must be performed by private construction contractors (not by a public agency including subcontracting).	Verification - Contract Bid and Award
Contract Time	The county must have procedures for determining contract time.	Verification - Contract Documents and Contract Bid and Award
FHWA-1273, Required Contract Provisions	Prohibits Hiring Preferences and Convict Labor (partial). Prohibits discrimination, including facilities; Predetermined Minimum wages (Davis-Bacon). Requires Certified Payrolls. Limits subcontracting. Requires construction safety standards.	Complaint Resolution Complaint Resolution Complaint Resolution Receipt Verification - Construction Complaint Resolution

	Prohibits false statements/fraud. Implements federal clean air and water quality legislation. Requires Certifications for debarment and lobbying.	Verification - Construction Complaint Resolution Verification - Contract Documents
Job Site Posters	A job site bulletin board must be in-place with a series of required posters.	Verification - Construction
Contractor Provided Labor (Also applies to subcontractors)	Contract documents cannot require any state or local hiring preferences (except as noted for Indian Employment Preference).	Verification - Contract Documents
Contractor Provided Materials (Also applies to subcontractors)	Contract documents will require that the private construction contractor furnish all materials needed to complete contract work.	Verification - Contract Documents
Patented/Proprietary Materials and Products	Materials and products to be incorporated into the project should be described using generic specifications. Trades names or brand names can only be listed if the material or product cannot be generically specified; at least three equal materials or products are to be listed.	Verification - Contract Documents
Contractor Provided Equipment (Also applies to subcontractors)	Contract documents will require that the private construction contractor furnish all equipment needed to complete contract work.	Verification - Contract Documents
Method of Measurement and Basis of Payment Extra Work - Change Orders	Contract documents must provide for the accurate measurement of quantities of completed work as the basis for payment.	Verification - Construction
Force Account - payment for the direct performance of work based on labor, materials, and equipment	The use of force account should only be used for work that cannot be clearly defined or accurately estimated in the original contract documents.	Verification - Contract Documents
Buy America Contract Clause	All iron and steel products, including coatings, must be supplied, including the manufacturing process, from within the United States.	Verification - Contract Documents Verification - Construction (Certifications)
Disadvantaged Business Enterprise (DBE)	Contract documents must ensure that those DBE firms, certified by WYDOT, have an opportunity to participate, typically by subcontract, in contract work.	Verification - Construction
Contractor Compliance – opportunities for females and minorities in contractor workforce	Required special provision.	Verification - Contract Documents Complaint Resolution
Indian Employment Preference	An Indian Employment Preference is allowed in contracts for projects located on roads on or near Indian reservations. May apply to the Wind River Indian Reservation and the Crow Indian Reservation (Montana at Wyoming State Line).	Verification - Contract Documents Complaint Resolution
Tribal Employment Rights Office (TERO) Tax.	A TERO tax is allowed in contracts for projects located on an Indian Reservation. May apply to the Wind River Reservation.	Verification - Contract Documents Complaint Resolution
Non-collusion Statement	A non-collusion statement is required from all bidders; failure to certify results in non-responsive bid (ineligible for contract award).	Verification - Contract Documents
Lobbying Certification	A lobby (no prohibited payments)	Verification - Contract

	certification is required from all bidders.	Documents
Suspension or Debarment Certification	A suspension and debarment certification is required from all bidders.	Verification - Contract Documents
Changed Condition Contract Clauses	The standardized changed condition clauses, in 23 CFR 109, must be included, verbatim, in all contract documents.	Verification - Contract Documents
Prompt Payment Clause for satisfactory performance of work, and retainage	Contract clause requiring prime contractor to pay subcontractors within 30 days of receipt of payment from county for all satisfactory subcontract work performed and retainage.	Verification - Contract Documents & Complaint Resolution
Warranty or Guaranty Clause	Warranty or guaranty clauses are not allowed for any work item that would be defined as future routine maintenance. Warranty or guaranty clauses are allowed as the basis for acceptance of work and workmanship during the terms of the contract. Landscape establishment periods, beyond contract time, are acceptable.	Verification - Contract Documents
Acceptance of Contract Work Materials Certification	The county must final accept all contract work and materials; contract documents must identify the point and method of acceptance.	Verification - Construction

Administrative Actions for State- and Federally Funded Projects: The county must certify to WYDOT that these projects have been completed in substantial conformance with the plans and specifications. The certification is presented in Appendix 7. As presented in the Administrative Actions section of this Manual, WYDOT representatives may inspect these projects at their discretion and/or may participate or make final inspections at their discretion.

POST CONSTRUCTION

State- and federally funded projects will require that the county accept provisions of a cooperative agreement for project maintenance and remain in service requirements. The executed cooperative agreement will require that the county comply with the following post-construction provisions:

Maintenance: Upon completion and acceptance of the project by the county and WYDOT, the county will maintain, at its sole expense, the roadway in compliance with all applicable state and federal standards and regulations. Maintenance will include all repairs necessary to keep the improvement in its original constructed condition.

In-Service: The county will agree to maintain the public road in service and not permanently close or abandon the public road without WYDOT's written consent.

DEFINITIONS

INTRODUCTION

County Road: A road that is open to the public; serves as access to farms, ranches, residences, businesses, and other local properties; and has been established in accordance with the provisions of W.S. 24-2-203 et.al.

PROJECT PLANNING

Functional Classification: WYDOT functionally classifies all public roads in Wyoming by rural and urban and by arterial, collector road, or local road.

- **Rural major collectors** primarily serve intra-county travel that involves shorter trips with moderate speeds and serve as links to arterial roads.

- **Rural minor collectors** primarily serve short trips at moderate speeds with these trips connecting rural areas with towns and serve as links to major collector or arterial roads.

- **Local roads** provide access to adjacent lands with short trips at lower speeds.

Design Vehicle: Four classes of vehicles have been established: passenger cars, buses, trucks, and recreational vehicles. Selection of a design vehicle, for example a school bus or single-unit truck with its dimensions and operating characteristics, is used to assist in project design. A "review or check" design vehicle—for example, a large school bus or a combination truck—should be used to evaluate the proposed design when the project type requires selection of a design year ≥ 10 years.

ROAD and BRIDGE DESIGN CRITERIA AND DESIGN VALUES

Bridge: A structure, including supports, erected over a depression or an obstruction, such as water, highway, or railway, having a track or passageway for carrying traffic or other moving loads and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments, or spring lines of arches, or extreme ends of openings for multiple barrel box culverts. It may include multiple pipes, where the clear distance between openings is less than one-half of the smaller contiguous opening.

Bridge Structural Capacity:

- **New Structures** (Including the replacement of existing structures):

    - **Bridge Design Vehicle**—The design vehicle (HL-93) to be used for all bridge construction and replacements.

- **Bridge Design Specification**—Load Resistance Factor Design (LRFD)—Latest edition of the *AASHTO LRFD Bridge Design Specifications* with applicable interim revisions.

- **Rehabilitation of Existing Bridges:**

  - **Bridge Design Vehicle**—The design vehicle (HS-20 or HL-93) to be used for all bridge rehabilitations or widening.

  - **Bridge Design Specification**—Standard specifications from latest version of the *AASHTO Standard Specifications for Highway Bridges* with applicable interim revisions. Load Resistance Factor Design (LRFD)—Latest edition of the *AASHTO LRFD Bridge Design Specifications* with applicable interim revisions.

  - **Minimum Inventory Load Rating Factor**—The minimum inventory rating factor that should be considered before a bridge is replaced. The inventory rating should be determined according to the Allowable Stress Rating (ASR) or Load Factor Rating (LFR) procedures outlined in the latest edition of the *AASHTO Manual for Bridge Evaluation* with applicable interim revisions. Bridges not meeting this design criteria and left in place will likely require load posting.

  - **Inventory Rating**—Load ratings based on the inventory level allow comparisons with the capacity for new structures and, therefore, result in a live load that can safely utilize an existing structure for an indefinite period of time.

  - **Load Rating**—The determination of the live-load carrying capacity of an existing bridge.

  - **Posting**—Signing a bridge for load restriction.

  - **Operating Rating (ASR, LFR)**—The load ratings based on the operating rating level generally describe the maximum permissible live load to which the structure may be subjected. Allowing unlimited numbers of vehicles to use the bridge at operating level may shorten the life of the bridge.

Bridge Scour Analysis: Scour is defined as the erosion or removal of river, streambed, or bank material from bridge foundations due to flowing water. To minimize potential bridge damage or failure, a scour analysis/inspection is completed to determine vulnerability to scour, using 100-year and 500-year design flood events.

Design Criteria and Design Values: (See the tables in the Road and Bridge Design Criteria and Design Values section of this Manual.) These design values must be met or a differing value must be supported with a design exception. The selection and use of these design values are also subject to the design practice that recommends against the use of all minimum design values.

Design Practices: (See the Road and Bridge Design Criteria and Design Values section of this Manual.) These practices for horizontal and vertical alignment must be met or any

revisions must be supported with a design exception. The selection and use of these practices are also subject to the design practice that recommends against the use of all minimum design values.

Design Elements: Design elements are included within this Manual; for example, see the Roadside Safety and Drainage—Pavements, Structures, and Facilities and Other Design Elements sections of this Manual. These design elements should be addressed, as needed, in each project type but are not subject to design exception administrative actions or to the design practice for minimum design values.

Current Safety Design Standards: The *Manual for Assessing Safety Hardware* (MASH) provides current methodology for evaluating new safety hardware and is currently in use as provided by a phase-in schedule. When phased in, MASH supersedes Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. For those MASH safety design standards with a delayed phase-in, the standards from Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features remain as the current practice.

Roadway: That portion of the highway, including shoulders, for vehicular use.

Traveled Way: The roadway portion that does not include the shoulders.

ROADSIDE SAFETY

Clear Recovery Area: Also referred to as Clear Zone and Horizontal Clearance to Obstructions. Defined as an area adjacent to the traveled way in which the slope, surface, and an absence of fixed obstacles can permit recovery of an errant vehicle.

Current Safety Design Standards: The *Manual for Assessing Safety Hardware* (MASH) provides current methodology for evaluating new safety hardware and is currently in use as provided by a phase-in schedule. When phased in, MASH supersedes Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. For those MASH safety design standards with a delayed phase-in, the standards from Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features remain as the current practice.

Traversable and Recoverable Fore slopes: Fore slopes at 1V:4H or flatter are considered both traversable and recoverable, meaning that an errant vehicle can be both controlled and redirected (steered or braked). Slopes at 1V:3H are considered traversable but not recoverable, meaning that an errant vehicle can be controlled but cannot be redirected (steered or braked).

DRAINAGE STRUCTURES AND FACILITIES

Roadway Cross-Slope (or Traveled Way Cross-Slope): The rate of downward slope from the crown to the edge of roadway or traveled way.

Cross-Slope Break: A maximum algebraic difference in the pavement cross-slope rate of the traveled way verses the cross slope rate of the paved or unpaved shoulder. This break may be referred to as cross-slope rollover.

Design Flood: The flood or storm used to size a drainage facility. Based on this design, the roadway will not be subjected to frequent overtopping, and traffic service will not be interrupted. As required in the Drainage—Pavements, Structures, and Facilities section of this Manual, drainage design elements are an important consideration for all project plans and should be supported with the project area hydrology resulting in a hydraulics analysis and report. The drainage area above the bridge structure and the type of drainage—river, stream, drainage channel—needs to be considered when selecting the design flood. For example, rivers such as the North Platte should be evaluated for a larger design flood event, exceeding the 15-year minimum or 10-year minimum.

Regulatory Floodway: The flood-plain area that is reserved in an open manner by federal, state, or local government requirements to provide (maintain) discharge of the base flood without a cumulative increase in the water surface elevation, exceeding 1 foot. Reference: National Flood Insurance Program.

APPENDIX 1—Referenced Wyoming Statutes

This Manual has been developed as a resource guide and is not intended to provide all technical or legal information and requirements of Wyoming statutes. Wyoming statutes Title 16, City, County, State and Local Powers, and Title 24, Highways, have been frequently referenced throughout the Manual, and those two statutes are summarized by chapter with the chapters, most referenced, being highlighted. Wyoming statutes infrequently referenced are summarized only by those chapters referenced in this Manual.

TITLE 9 – ADMINISTRATION OF THE GOVERNMENT
CHAPTER 2 - AGENCIES, BOARDS, COMMISSIONS AND DEPARTMENTS GENERALLY
- 9-2-1027 & 1028 - Professional Architectural, Engineering and Land Surveying Services Procurement Act (Appendix 2)

TITLE 16 – CITY, COUNTY, STATE AND LOCAL POWERS
CHAPTER 1 - INTERGOVERNMENTAL COOPERATION
CHAPTER 2 - FACSIMILE SEALS AND SIGNATURES
CHAPTER 3 - ADMINISTRATIVE PROCEDURE
CHAPTER 4 - UNIFORM MUNICIPAL FISCAL PROCEDURES; PUBLIC RECORDS, DOCUMENTS AND MEETINGS
CHAPTER 5 - PUBLIC SECURITIES
CHAPTER 6 - PUBLIC PROPERTY
- **ARTICLE 1 - PUBLIC WORKS AND CONTRACTS**

CHAPTER 7 - RELOCATION ASSISTANCE
CHAPTER 8 - OUTDOOR ADVERTISING
CHAPTER 9 - TELEPHONE SERVICE
CHAPTER 10 - SURFACE WATER DRAINAGE
CHAPTER 11 - SHOOTING RANGES

TITLE 24 – HIGHWAYS
CHAPTER 1 - GENERAL PROVISIONS
CHAPTER 2 - DEPARTMENT OF TRANSPORTATION
CHAPTER 3 - ESTABLISHMENT, VACATION OR ALTERATION OF COUNTY HIGHWAYS
CHAPTER 4 - COUNTY FARM-TO-MARKET ROAD PROGRAM
CHAPTER 5 - INDUSTRIAL ROAD PROGRAM
CHAPTER 6 - ACCESS FACILITIES
CHAPTER 7 - RELOCATION OF HIGHWAYS
CHAPTER 8 - BONDSCHAPTER
CHAPTER 9 - ESTABLISHMENT OF PRIVATE ROADS
CHAPTER 10 - OUTDOOR ADVERTISING
CHAPTER 11 - LOANS TO TRANSPORTATION COMMISSION
CHAPTER 12 - HIGHWAY PATROL
CHAPTER 13 - UTILITY RELOCATION ASSISTANCE
CHAPTER 14 - STATE PARK ROAD PROGRAM
CHAPTER 15 - PUBLIC TRANSIT PROGRAM

TITLE 31 – MOTOR VEHICLES
CHAPTER 5 - REGULATION OF TRAFFIC ON HIGHWAYS
- 31-5-102 – Definitions (Paved and unpaved roadways)
- 31-5-301 – Maximum speed limits

TITLE 33 – PROFESSIONS AND OCCUPATIONS
CHAPTER 29 - PROFESSIONS AND OCCUPATIONS
- 33-29-135 - Public works.

APPENDIX 2—Wyoming Procurement Act

9-2-1027. Short title.

This act is known and may be cited as the "Professional Architectural, Engineering and Land Surveying Services Procurement Act".

9-2-1028. Definitions.

(a) As used in this act:

(i) "Agency" means any state office, department, board, commission, institution or other operating entity of the state excluding the University of Wyoming, community college districts, school districts, the Wyoming business council and the Wyoming department of transportation;

(ii) "Department" means the state department of administration and information;

(iii) "Firm" means an individual, corporation, partnership, business trust, association, firm or any other legal entity permitted by law to practice in a specified profession;

(iv) "Principal representative" means the governing board of a department, institution or agency or its designated representative, or, if there is no governing board, the executive head of a department, institution or agency;

(v) "Professional services" means:

(A) The practice of architecture pursuant to W.S. 33-4-101 through 33-4-117;

(B) The practice of engineering or land surveying pursuant to W.S. 33-29-114 through 33-29-149.

(vi) "This act" means W.S. 9-2-1027 through 9-2-1033.

9-2-1029. Duties of department.

(a) The department shall:

(i) Develop and maintain approved lists of qualified architects, engineers and land surveyors for selection under this act; and

(ii) Develop and administer notification procedures for obtaining professional services under this act.

9-2-1030. Qualification procedures.

(a) Any firm desiring to provide professional services to an agency, shall annually submit to the department and [or] the agency a detailed statement of qualifications and performance data, and any other information required by the department or the agency. The department or the agency may request the firm to update its statement before submission in order to reflect changed conditions in the status of the firm.

(b) If professional services in an amount exceeding five thousand dollars ($5,000.00) are required, the department or the agency shall notify all qualified architects, engineers and land surveyors of record who have submitted an annual statement of qualifications and performance data. In addition, the agency or the department shall give statewide notice in a newspaper of statewide circulation at least once each week for four (4) consecutive weeks prior to initiation of selection procedures in accordance with W.S. 9-2-1031. Notification shall contain a general description of the proposed project, and shall indicate the procedures by which interested firms may apply for consideration for a contract to provide professional services for the proposed project.

9-2-1031. Selection procedures.

(a) For each proposed project, the principal representative of the agency for which the project is proposed shall evaluate current statements of qualifications and performance data of firms on file with the department or the agency, together with any applications submitted by other

qualified firms, and shall select not less than three (3) firms considered qualified to perform the required professional services. Consideration in each selection process by the principal representative shall be based upon the ability of professional personnel, past performance, willingness to meet time requirements, location, current and projected work loads, the volume of work previously awarded to the firm by the agency, and the equitable distribution of contracts among qualified firms. The agency shall provide a complete description of the work to the firms selected. These firms shall submit an unpriced proposal to do the work.
(b) In addition to the requirements of subsection (a) of this section, for any professional services fee estimated by the agency to exceed twenty-five thousand dollars ($25,000.00) or, for any project the total cost of which is estimated to exceed one hundred thousand dollars ($100,000.00), the principal representative shall interview not less than three (3) firms selected from those which have submitted proposals to do the work. The interview shall be recorded and include discussion of each firm's projections of project costs, qualifications, approaches to the project, ability to furnish required professional services, use of alternative methods for furnishing required professional services and an estimated fee based on the agency's description of the work. The estimated fee may be used as a basis, along with the qualifications listed in subsection (a) of this section, for selection by the principal representative of the most qualified firm for contract negotiations. If unsatisfied with the results of such interviews, the principal representative may select not less than three (3) additional firms for interviews as provided by subsection (a) of this section.
(c) In addition to the requirements of subsection (a) of this section, for any professional services fee estimated by the agency to be twenty-five thousand dollars ($25,000.00) or less, or for any project the total cost of which is estimated to be one hundred thousand dollars ($100,000.00) or less, the principal representative shall select three (3) firms from which a project specific submittal shall be requested. The information provided by the firm shall include an estimated fee and preliminary scope of services based on the agency's description of the work. The estimated fee may be used as a basis along with the qualifications listed in subsection (a) of this section, for selection by the principal representative of the most qualified firm for contract negotiations.
(d) Nothing in this section prohibits a principal representative from determining that fewer than three (3) firms with current statements on file or which have submitted applications before selection are qualified to perform the required professional services. If a principal representative makes that determination, subsections (b) and (c) of this section apply with respect to the firms the principal representative considers qualified.
(e) The department, in conjunction with the agencies, shall adopt rules and regulations necessary to implement the selection process provided by this section.

9-2-1032. Contract procedure.
(a) After completing the selection process, the principal representative shall negotiate a written contract with the selected firm as determined by W.S. 9-2-1031 for the provision of services. The principal representative shall consider the estimated value, scope, complexity and professional nature of the services to be rendered when determining a reasonable compensation.
(b) If the principal representative is unable to negotiate a satisfactory contract with the selected firm at a price he determines fair and reasonable, negotiations with that firm shall be terminated. The principal representative shall then begin negotiations with the firm ranked second in order of preference pursuant to W.S. 9-2-1031. If the principal representative fails to

negotiate a contract with the second ranked firm, he shall terminate negotiations. The principal representative shall then begin negotiations with the firm ranked third in order of preference.
(c) If the principal representative is unable to negotiate a satisfactory contract with any of the selected firms, he shall:
(i) Select additional firms in order of their competence and qualifications and continue negotiations in accordance with this section and W.S. 9-2-1031, until a contract is reached; or
(ii) Review the contract under negotiation to determine the possible cause for failure to achieve a negotiated contract.
(d) Each contract for professional services entered into by the principal representative shall contain a prohibition against gratuities, kickbacks and contingent fees. The architect, registered land surveyor or professional engineer shall certify under oath that he has not in any way been involved in any gratuities, kickbacks, or contingent fees in connection with his selection or ultimate performance of this contract.
(e) Each contract for professional services entered into by the principal representative shall contain a prohibition against payment based upon a percentage of the construction cost.
(f) This act shall not prohibit continuing contracts between any person providing professional services and any agency.

9-2-1033. Prohibited acts; civil penalty; initiation of action.
(a) No person, including any agency official or employee, shall:
(i) In any way be involved in any gratuities, kickbacks, or contingent fees in connection with the selection procedure set forth in this act;
(ii) If providing professional services, pay any fee, commission, gift or other consideration contingent upon the award of a contract for professional services pursuant to this act.
(b) Any person violating subsection (a) of this section or subsection (d) of W.S. 9-2-1032 is liable for a penalty not to exceed five thousand dollars ($5,000.00). The penalty may be recovered in a civil action and damages shall be assessed by the court.
(c) Any action pursuant to this section shall be initiated in Laramie County by the attorney general.

APPENDIX 3—Design Exceptions

A design exception is an administrative action that may be appropriate when it is difficult or cost prohibitive to achieve full compliance with a design value as presented in Design Criteria and Design Values (Tables 1, 2, and 3) from the Road and Bridge Design Criteria and Design Values section of this Manual.

Design exception requests must provide a project description, clearly state the proposed exception, address conditions dictating the need for the exception, present alternatives considered, and provide any other supporting information or data that further justifies the request. Each request should consider the effect of a differing design value on the overall purpose of the project, the resultant roadway operations, and the resultant roadway safety. A cost analysis may also be used to support the design exception.

Certain design exceptions, such as bridged vertical clearance, may require coordination with other owners or agencies, including WYDOT and operating railroads.

Evaluation and documentation for a design exception should be completed under the direct supervision of and be stamped and signed by a Wyoming-registered professional engineer or be reviewed and accepted by a Wyoming-registered professional engineer. Documentation for a design exception, for all projects, will be presented to the Board of County Commissioners for its approval and submitted to WYDOT for its concurrence on state- and federally funded projects.

Documentation and approval or concurrence for a design exception should be completed prior to initiating final design.

APPENDIX 4—Bridge Evaluation

When a bridge is evaluated for replacement, widening, or rehabilitation, the following items should be considered. This list is not all inclusive but should used as a starting point. As always, a Wyoming-licensed professional engineer should be consulted to determine the appropriate scope of work.

☐ Minimum load rating.
Bridges not meeting the minimum criteria and left in place will likely require load posting.

☐ New versus old roadway width.
Roadway width—Adequate for design year traffic?
Pedestrian use—Are sidewalks needed?

☐ Cost of rehabilitation/widening versus replacement.
Does the cost to rehabilitate or widen match or exceed the cost to replace?

☐ Structure type and the ability to strengthen or widen.
Can the existing substructures carry additional load from a widened or replaced superstructure?
Can the existing girders be strengthened to meet current design load standards?

☐ Hydraulic issues.
Scour protection.
Is the bridge designated scour critical?
Change in headwater depths that can affect developed property.
Change in land use.
Drainage area.
Waterway type.

☐ Foundations.
Capacity—Can the existing foundation carry additional load?
Type—Is the current foundation type known?
Is the foundation protected from scour based on hydraulic scour analysis?

☐ Land use.
Roadway Width—A new bridge being designed under the LRFD specification has an anticipated life of 75 years with appropriate maintenance. Is there any anticipated development in the area that would require a wider roadway? Will trucks and/or farm equipment be using this route? Is this a school bus route?
Roadway alignment to match future development.

☐ Rehabilitation.
Many times, rehab work may not increase the structure appraisal ratings, including the sufficiency rating. The WYDOT Bridge Program can provide help looking at the bridge inspection report and can help provide guidance on areas that can be worked on to improve the structure assessment.

☐ Bridge railing and transitions
Do they meet current safety design standards?

APPENDIX 5—Environmental Impact Evaluation

Resource	**Impact: Minimal, No Impact, Not Present**
Land Use Changes	_____
Relocation Potential	_____
Churches and Schools	_____
Emergency Routes	_____
Recreational Sites (Parks)	_____
Historic Sites	_____
Archaeological Sites	_____
Section 4(f)	_____
Wetlands	_____
Water Quality	_____
Floodplains	_____
Wildlife and Habitat	_____
Prime Farmland	_____
Threatened and Endangered Species	_____
Contaminations - Hazardous Materials	_____
Noise or Air	_____
Temporary	_____
Other	_____
Remarks	_____
	_____
	_____

APPENDIX 6—Right-of-Way and Utility Certificates

Right-of-Way Certificate

The County of _____, Wyoming, hereby certifies to the Wyoming Department of Transportation and the Federal Highway Administration this _____(day) of _____ (month), _____, (year) that it owns or has acquired all right-of-way necessary for construction of Project _____ _____ and has complied with the policies set forth in Title 42, Chapter 61, The Federal Uniform Relocation Assistance and Land Acquisition Act.

_____

County Representative Date

Utility Certificate

The County of _____, Wyoming, hereby certifies to the Wyoming Department of Transportation and the Federal Highway Administration this _____ day of _____ month, _____year that it has provided for removal of any and all utilities or other encroachments on or within land as necessary for construction of Project _____ _____. Utilities relocations/adjustments within the project limits of construction have been completed or are incorporated in the contract plans as biddable work.

_____

County Representative Date

APPENDIX 7—Project Acceptance Certificate

WYOMING DEPARTMENT OF TRANSPORTATION

Project Acceptance Certificate

COMPLETED BY COUNTY

The County of _____ hereby accepts and certifies that Wyoming Transportation Project _____ has been completed in accordance with plans and specifications, and agrees to accept full maintenance thereof, this _____ day of _____, 20___.

The County further certifies that all materials incorporated into the project were accepted in conformance with the sampling and testing required by plans and specifications.

Attest:_____ _____

Project Manager Board Chairman

Wyoming Transportation Project _____, has been designed and constructed according to accepted engineering standards.

Attest:_____

Engineer, Wyoming P.E. License No.

COMPLETED BY WYDOT

Wyoming Transportation Project, _____, is accepted as complete as certified above by the sponsoring entity and its professional consulting engineer and is hereby approved for final payment.

Signed:_____

WYDOT District Engineer

APPENDIX 8—Wyoming County Roads Standard Committee

Wyoming Statute 24-2-110 (f) creates a Wyoming County Standards Committee and (g) gives that committee the responsibility to furnish standards for the construction and maintenance of county roads to a board of county commissioners, upon request, and to advise with respect to highway construction, maintenance, and improvements. Committee representatives are as follows:

Ross Turner, P.E. & L.S. (Retired) Lincoln County Engineer
Chairman, Standards Committee
Afton, WY 83110
Phone: (307) 886-3488

Richard Ladwig
Niobrara County Commissioner
Box 1238
Lusk, WY 82225
Courthouse: (307) 334-2211

Tom Bruce
Weston County Commissioner
1 West Main
Newcastle, WY 82701
Courthouse: (307) 746-2684

Travis Conklin, P.E.
Engineering Associates
PO Box 1900
Cody, WY 82414
Phone: (307) 587-4911

Scott Larson, P.E.
BenchMark of Cheyenne, PC
920 Thomes, Suite 620
Cheyenne, WY 82001
Phone: (307) 634-9064

Errol Miller, P.E. (Assisted with this Manual; formally a representative of the Committee)
71 Construction
Casper, WY 82604

Jeff Johnson, P.E.
S&S Builders, Gillette
400 Enterprise Avenue
Gillette, WY 82716
Phone (307) 682-5985

Don Beard
Laramie County Road and Bridge
2305 Fox Farm Road
Cheyenne, WY 82007
Phone (307) 633-4302