DOCUMENTATION OF PAY ITEM QUANTITIES

General Responsibility

The Engineer is responsible for ensuring that all quantity measurements are made and documented in accordance with the Specifications and instructions included in this Manual. Section .420 of this manual includes a compilation of the Methods of Measurement, Basis of Payment and documentation requirements for all pay items contained in the Standard Specifications. The Special Provisions and Project Plans may address specific methods of measurement and payment requirements for certain pay items that supersede the Standard Specifications.

Item Record Account (IRA)

The IRA is the basis of recording and documenting all pay quantities. Upon Contract Award each Contract pay item has an IRA that is downloaded from the Office of Construction & Innovative Contracting (OCIC) to the Engineer via the field computer application. Pay quantities may be entered directly on the IRA or transferred from other records. Quantities may only be entered on the IRA when they are satisfactorily furnished and installed and become eligible for payment. The quantity entries, including supporting documentation, serve as both partial and final verification that correct payments are made on all vouchers. There are two types of quantity entries made by the Engineer, Contract Bid Pay Items and Back Sheet Pay Items described as follows:

Contract Bid Pay Items

All pay items in the Contract for which the Contractor submits a unit bid price, are referred to as "body" items and are entered and documented as they are satisfactorily furnished and placed and become eligible for payment. See Section .420 of this Manual for pay item documentation requirements and instructions.

Back Sheet Pay Items

Back sheet pay items are those contractual payments provided for by the Standard Specifications, Plans or Special Provisions, excluding Contract bid Items and Supplemental Agreement pay items. Back sheet payments require the creation of an IRA by the Engineer. The quantities for these items are then entered as they are satisfactorily furnished and installed and become eligible for payment. Each IRA entry for Back sheet items must include a payment authorization. Examples:

- Credit taken for out of tolerance B624 Curb & Gutter as per Standard Specification 2531.3 K (1).
- Items for additional traffic control as per Special Provision S-_____.
- Water for dust control as per Standard Specification 2130.5

Entries for Work Orders for Minor Extra Work payments must include the payment entries and a brief explanation of why the extra work was required of the Contractor.

OCIC downloads IRA's for pay items created by Supplemental Agreements to the field upon approval of the Agreement. When the download is properly installed into the field computer application, IRA's for each Supplemental Agreement Item will be automatically created.

Distribution of Pay Quantities by Group

Pay quantities on construction projects are usually divided into separate pay groups. The individual groups are identified on the first page of the payment voucher and further explained on subsequent pages. Group splits are required in order to account for separate costs such as: federal funds, state funds, costs that will be borne by local government agencies, and other unique situations. The accounting and appropriate billings are made by the Mn/DOT Office of Finance and are based on the Final Voucher quantities.

Review group descriptions and locations prior to documenting and recording pay quantities. An Item Record Account is provided for each group in which a pay item is included.

The Engineer is responsible for appropriate pay group distribution of all Contractual Pay items and Back Sheet payments.

If there is a Municipal Agreement associated with a Contract, see Use of Change Order in this section.

Change in the Method of Measurement of a Contract Pay Item.

Any change in the method of measurement from the method specified in the specifications or special provisions shall be clearly documented either by Change Order or by entering an explanation of the change on the applicable Item Record Account(s). The unit of measure, for payment purpose, must remain the same as the original contract item, and may require a conversion factor to accomplish. Any conversion factor(s) that will be used must be included either by Change Order, on the supporting documentation or with the explanation in the "Remarks" field of the Item Record Account (IRA).

For Example: Item Gravel Base Class 5 is designated by the Contract to be paid for by the ton. The method of measurement is changed to Cubic Yard (LV). In this case, the Cubic Yard total obtained by field measure must be converted back to tons for payment by using a conversion factor similar to 1.0 Cubic Yards. (LV) = 1.40 tons. Using this example, if a Change Order is <u>not</u> used, the following (or similar statement would be necessary either on the supporting documentation (Haul Sheets or directly on the IRA in the "Remarks" field.

“The method of measurement for Contract Item No. 2211.501 Gravel Base Class 5 is changed from ton scale weight to Cubic Yards (LV). Cubic Yard totals will be converted back to tons for payment by using a conversion factor of 1.0 Cubic Yard (LV) = 1.4 tons"

If a Change Order is used to accomplish a change in the method of measurement, it would be written to include all of the above requirements. When a Change Order is used the "Remarks" field of the IRA would simply state "See Change Order # _____”.

In all cases, whenever a change in the method of measurement occurs, the new method of measurement will dictate the "Supporting Documentation " that must be properly referenced on the IRA and submitted to OCIC with the final records.

Supporting Documentation

The term "Supporting Documentation" is defined as any physical record that was created to serve as verification of either a partial or final pay quantity of a pay item. For daily update entries, the nature of these records must be entered on the IRA in either the "Document Location / Verification" field or the "Remarks" field. (Example: Concrete Measurement Book). For final documentation, this same Concrete Measurement Book that was used as support for each daily entry, will be completed and more specifically referenced in the "Final Document Location" field as BOOK B-1 PAGES 1-8 CONCRETE WALK. Supporting Documentation includes, but is not limited to, various books, booklets, envelopes, forms, packets, quantity tabulations, data collection forms, and other field measurements/computations.

No erasures or overwriting is permitted in any documentation. If an error is made it will be corrected by neatly crossing out the erroneous data with a single line and entering the correct data in the most logical place.

Source Documentation

Application
When using "Source" Documentation, the user is declaring that "Supporting Documentation” is nonexistent and was at no time ever created to document the quantity. If any "Supporting Documentation does exist, it must be submitted with the final records and "Source" cannot be used. To qualify as "Source Documentation", all entries must be entered directly on to the Item Record Account via the field computer application Update option, with no intermediate transfers of entries taken from other documents.

Verification

In order for "Source Documentation" to be valid it must be accompanied by an explanation of how the quantity being entered is verified. For daily Update computer entries, this verification must be entered on the Item Record Account in either the

Document Location / Verification field or the "Remarks" field of the Item Record Account. (Examples of this verification would be: Actual field measure, field count, date completed, etc) As final documentation, the Documentation Location field of the field computer application Certify option will simply state "Source Documentation" as a reference.

The use of "Source Documentation" does not relieve the user from meeting any of the quantity verification requirements. Sufficient data to fulfill all documentation requirements for the item must be contained solely on the applicable Item Record Account.

Quantity Documentation Using the Computer Generated Data Collection Forms (Also referred to as Field Record Documentation FRDs).

Using the Reports option, the user has the capability to create Data Collection Forms within the field computer application for use in documenting pay quantities. These forms are self-explanatory and are designed to fulfill daily documentation requirements when completed correctly. When FRDs are used, they become part of the supporting documentation and must be properly referenced on the applicable Item Record Account and submitted with the final records.

The Data Collection Form (FRD) will be acceptable documentation in lieu of any specific Mn/DOT forms requirements contained in section .420 of this manual; provided all of the quantity documentation required by the form is present. However, there may be a reason other then quantity documentation that would cause you to adhere to the required form. (Example: You would want to use the required Mn/DOT Form 2210 Pile Driving Report to document 2452 Piling pay items because in addition to quantity documentation Mn/DOT form 2210 requires you to enter other vital information (i.e. pile penetration, bearing, elevations, etc.)

(P) Plan Quantity Documentation

(P) Plan Quantity Item designations are found only in the Statement of Estimated Quantities contained in the project Plans. NOTE: Even though the (P) designation is contained in the Statement of Estimated Quantities the Engineer can change the method of measurement from (P) Plan Quantity to an actual field measured item, on any item so designated, provided it is agreed upon by both the Engineer and the Contractor. The inverse is also true, as any pay item can also be designated as a (P) Plan Quantity item with the mutual agreement of the Engineer and Contractor, even if it is not so designated in the Statement of Estimated Quantities.

Manually entering (P) Plan Quantity Designations in the Field Computer Application

(P) Plan Quantity Item Designations are not included in the original project download to the Engineer. All (P) designations must be manually entered into the Field Computer Application in order to match the (P) designations contained in Statement of Estimated Quantities plan sheets. These entries should be made in Field Computer Application at the onset of the project.

Verification / Documentation

If no change in the Contract Proposal Quantity occurs, Final Documentation of a (P) Plan Quantity is accomplished by completing the following "Plan Quantity Statement"

"The finished product is in close conformity with the specified dimensions as verified by the _____ method."

The blank space provided in the above statement will be used to indicate the method of **checking** that was used in lieu of actual field measurement to verify that the specified dimensions used to originally establish the Contract Proposal (P) Quantity were attained. (Examples: form check, depth check, length-width- depth, stake check etc. These check measurements will be retained in the Engineer's project records to substantiate the validity of the Plan Quantity statement.

Documenting Changes to (P) Plan Quantity

In order to provide flexibility for increases or decreases all (P) items are bid by a measurable unit and price (such as $4.00 per Cubic Yard). For quantity documentation purpose, any change in (P) Plan Quantity is classified as either a *computed only change* or an *actual field measured change.*

Documenting a Computed Only Change to (P) Plan Quantity – [New (P) Plan Quantity]

If the Contract Proposal Quantity of a (P) item is changed based on computation only, (either in part or as a whole), the single "Plan Quantity Statement" and "Source Documentation will then apply to the new (P) Quantity arrived at by adding (or subtracting) the computed changed portion of the Final Pay Quantity to the original contract Proposal Quantity. Computations of this type that are not based on actual field measurements will remain in the engineer's files.

Documenting an Actual Field Measured Change to (P) Plan Quantity – [(P) Plan Quantity Plus]

Any actual field measured additions or subtractions to the (P) Plan Quantity must include all "Supporting Documentation" with the Final records. On the Item Record Account, any actual field measured change must be documented separately from the computed only changes portion of the Final Pay Quantity.

Use of the Change Order to Document Changes in (P) Plan Quantity

It is recommended to document changes to (P) Plan Quantity via Change Order. This is especially true when dealing with (P) items that have a large quantity. [Example: Item 2105.501 Common Excavation 785,000 Cu. Yd. (P)]. It is not unusual for an item such as Common Excavation to undergo both computed and actual field measured changes several times throughout the life of the Contract. In these cases the Change Order is a good tool to document each change step by step. In all cases, the following information is required to document any change to (P) Plan Quantity:

- Reason for change
- Location
- Specific Increase / Decrease Quantity
- Method of Measurement- Actual Field Measured or Computed

Use of Change Order on Projects that have Municipal Agreements with (P) Plan Quantity Items

When a Municipal Agreement is connected to a Contract, it is highly recommended that any changes in quantity of a (P) Plan Quantity Item be documented by Change Order. Use of a Change Order will serve to clearly delineate the proper quantity splits for each Group. The Change Order will also eliminate the need for the Mn/DOT Municipal Agreement section to search field records to locate documentation. Municipalities routinely request this information /documentation to verify their portion of financial responsibility in the project. (Often a municipality will request this information long after the project is completed.)

In the absence of a Change Order, such changes may also be made by including all of the above-required information on the applicable Item Record Accounts or by separate record. In all cases, documenting changes to (P) Plan Quantity Items must have a clear and logical audit trail.

Secondary Documentation

When it is found impractical or impossible to comply with the documentation requirements of a pay item as set forth in this manual, secondary documentation can be used.

Secondary documentation is a three-step process whereby the Engineer:

- Recognizes the problem of documenting a pay item in the manner required.
- Resolves the situation by using a logical, secondary method to accomplish the documentation.

- Explains the circumstances necessitating the use of Secondary Documentation

An explanation must be included for each item where Secondary Documentation is used. This explanation can either be entered directly on the Item Record Account or affixed to the actual Secondary Documentation submitted with the Final records.

When original documentation is lost or destroyed due to unforeseen circumstances such as fire, flood, vandalism, etc. it will become necessary to document pay items in a secondary manner. Each situation is unique. Prior to attempting to document pay item(s) in this manner the Project Engineer should contact the Contract Administration Supervisor in OCIC to discuss and determine what secondary documentation is appropriate (or possible).

SPECIAL NOTES

Standard Plate Items

If any pay item is placed in accordance with a Mn/DOT Standard Plate which has predetermined quantities set forth (or formula for such quantities), these quantities (or formulas) will be accepted in lieu of any measurements or computations required elsewhere in this manual, provided a statement on the Item Record Account (or other supporting documentation) confirms that the item was placed in accordance with the provisions of said Standard Plate. (Example: Class II Riprap placed in accordance with Standard Plate No. 3133C.)

Special Pay Items

Special pay items, not specifically covered by the Standard Specifications, shall be measured and documented in accordance with the method of measurement and basis of payment outlined in the Contract Special Provisions. If a special pay item is not addressed in the Contract Special Provisions, measurement and payment shall be made in accordance with the Standard Specifications as applied to a similar or "like" pay item.

Invoice Documentation (Non-Force Account)

When shipments are received on the project and the Contractors invoice will serve as documentation of a Contract pay item, the Field Inspector shall make certain that the material furnished is indicative of the quantities shown on the invoice. The Inspector shall initial the invoices to verify the quantity of material used and identify the State Project No. on each invoice.

Lump Sum Items
Pay Lump Sum items as directed in the Standard Specifications for Construction or the special provisions. Pay percentage complete for item on each partial estimate if no schedule of payment is provided. Pay 100 percent upon satisfactory completion of the item. All lump sum items used must have a final quantity of one.

Vehicular Measure

The hauling capacity of trucks, trailers and semi-trailers shall be documented on Form 2141 (Computation of Truck Box Capacities). The hauling capacity of scrapers shall be documented by listing the make model number and manufacturers rated struck capacity on form 28266 (Quantity Tally Sheets). If sideboards are added, measure and compute the added capacity on form 2141 and add it to the manufacturer's rated struck capacity. Heaped capacity is restricted to elevating scrapers only.

Uniform Load Establishment & Method of Quantity Verification
There are numerous acceptable methods of establishing uniform loads and various methods of quantity verification. Often, the methods used are not readily evident by the documentation submitted with the Final records. When this is the case, the Engineer will include with the Final records, a short memorandum addressed to OCIC that explains the specific steps taken in both the establishment and the verification of such loads.

Uniform Load Documentation - Spot Checks

Documentation of Uniform Loads shall be accomplished on Weigh Tickets or form 28266 (Quantity Tally Sheets) and the daily spot checks.

Spot Check Weight - Spot checks will be as determined by the Engineer, and will be performed as follows: A loaded truck selected by the Engineer shall be stopped and directed to a commercial scale were the actual weight of material is determined to assure that this actual load is equal to or exceeds the established uniform load weight. The commercial scale tickets showing tare, gross and net weight checks shall be recorded and submitted with the Final, with proper reference on the applicable Item Record Account (IRA).

Spot Check Volume - Spot checks will be as determined by the Engineer, and will be performed as follows: The Contractor shall level the load upon its arrival at the point of delivery if so directed by the Engineer. No allowance will be made for material heaped above the struck capacity of the vehicle. The actual volume of material will be determined to assure that this actual load is equal to or exceeds the established uniform load volume. The results of these spot checks may be recorded directly on form 28266 (Quantity Tally Sheets), or by separate record. All spot check records shall be submitted with the Final, with proper reference on the applicable IRA.

Weigh Tickets

A copy of form 21820 "Instructions for Proper Validation of Weighing Tickets Form 2177" must be posted in the scale house prior to weighing pay quantities. Each scale person and street checker should be familiar with these instructions before performing their duties. A Field Inspector must initial all tickets at the point of delivery and verify the S.P. No. on each ticket.

Rounding Procedures

The "Unit" columns in section .420 of this manual show the units (Cu.Yd.; Lin. Ft.; 0.1 Cu. Yd.; etc.) to which the individual Contract pay items will be paid. Items that are to be paid to fractions of the unit are so designated in this "Unit" column. In addition, pay items shown as fractional quantities in the "Approximate Quantities" column of the Proposal should be rounded-off and paid as fractional quantities. All other units will be paid to the closest whole unit.

Exceeding the accuracy of the requirements shown in the "Unit" columns in section .420 of this manual will be acceptable for all pay items. Rule: No pay item used will be rounded to a "0" (Zero) Final Pay Quantity. The objective of the rounding procedures is to create a fair payment for any pay item. Consistent math rounding procedures throughout a ***given pay item*** will be used in all intermediate measurements leading up to the Final Pay Quantity for that item.

Rounding Exception

When a pay item has a substantial Unit Price, paying to the closest whole unit can at times cause undue overpayment or underpayment to the Contractor. (For example: Structural Concrete @ $300.00 per Cubic Yard). In this case, the Engineer may use discretion to invoke a "Rounding Exception".

Using the above Structural Concrete example, the Engineer may want to pay to the closest 0.1 of a Cubic Yard rather than to the closest 1.0 Cubic Yard as designated in section .420 in this manual. This "Rounding Exception" can be used on all pay items except those items that are to be measured as "Each", "Lump Sum" or (P) Plan Quantity. Common sense will prevail and no special notation on the Item Record Account will be required when "Rounding Exception" is used.

Elimination of Pay Items / Pay Items Not Used or Needed

Whenever any pay item is either eliminated by the Engineer or not used or needed, the Item Record Accounts for those pay items will show a Final Pay Quantity of "0" (Zero). In addition, an explanation of why the item was not used must be given in the "Final Documentation Location" or "Remarks" field of the applicable finalized Item Record Account. Examples: (Item not used; Item eliminated by Engineer or similar statement).

Special Forms Requirements

It is acceptable to replace any of the special forms required by Section .420 of this manual with a District office computer generated version. However, in order to be acceptable, all of the information and documentation requested by the original form must be accurately included with the computer generated version. (Also see Data Collection Form (FRD) mentioned previously in this section).

Form 17151 (12-62)

MINNESOTA DEPARTMENT OF HIGHWAYS

MAINTENANCE SECTION

VERTICAL AND HORIZONTAL BRIDGE CLEARANCE REPORT

T.H.No. 494

BRIDGE No. 22713 + 22713A

COUNTY Henn DATE OF INFORMATION 3-28-90 MAINT AREA No. Metro

LOCATION 0.3 mi E of JCT TH 169
(Distance N-S-E-W from nearest town or highway intersection)

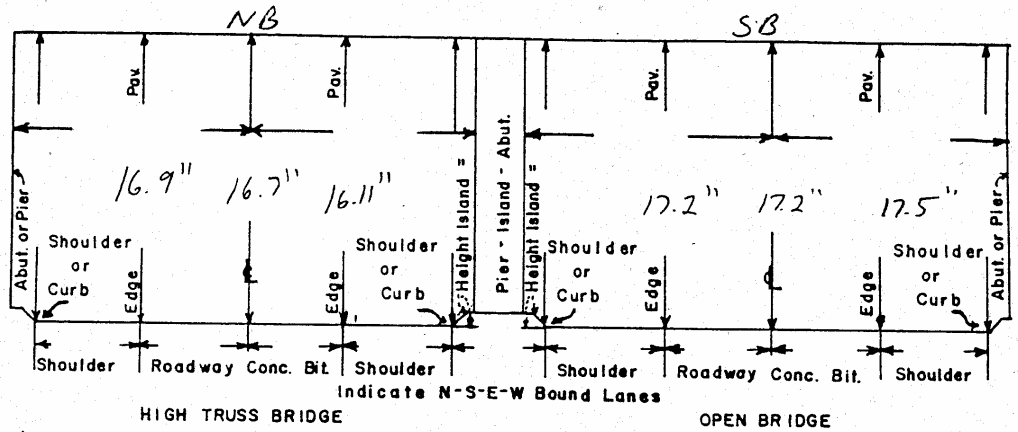
TYPE OF BRIDGE 501 BM SPAN

OVER OR UNDER WB Prairie Center Dr + RAMP
(Name or number Railroad - Highway - Street - County Road - River - Stream - Creek)

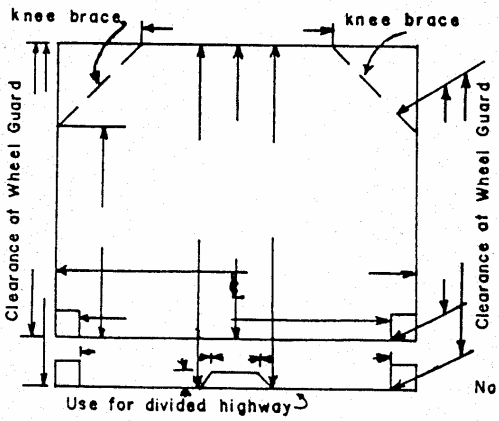
TYPE OF HIGHWAY INTERCHANGE ½ Diamond
(Draw Sketch on Reverse Side)

LOAD LIMIT Legal PERMIT LOAD LIMIT 88

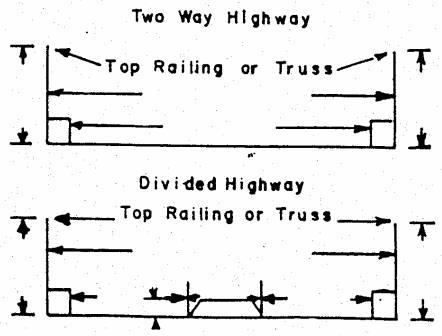
UNDERPASS - - DIVIDED HIGHWAY OR TWO WAY HIGHWAY



HIGH TRUSS BRIDGE



OPEN BRIDGE

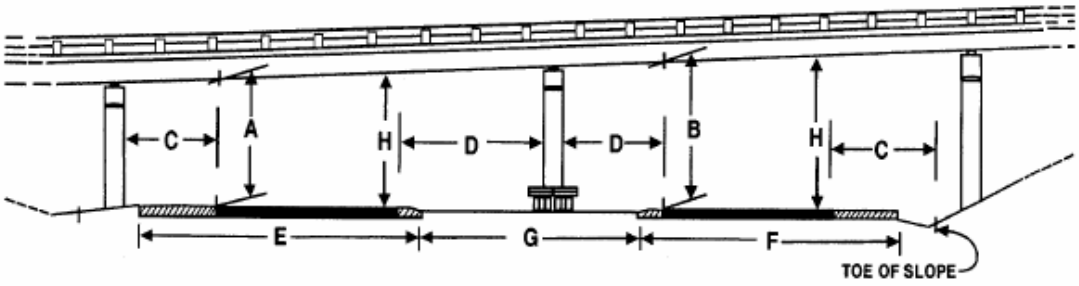


Note: Show Sidewalks and indicate side of bridge N-S-E-W

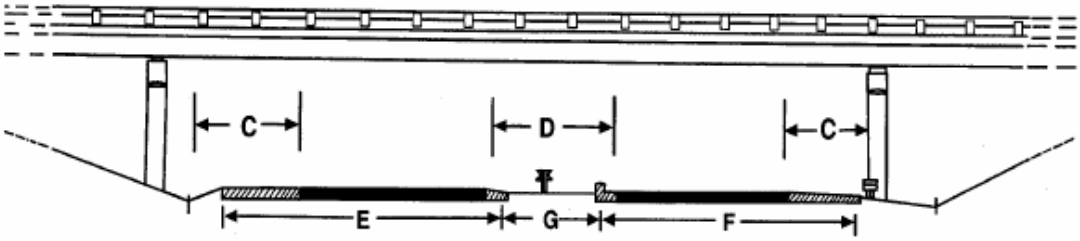
SAMPLE FORM 17151 – VERTICAL AND HORIZONTAL CLEARANCE REPORT

UNDERPASS MEASUREMENTS

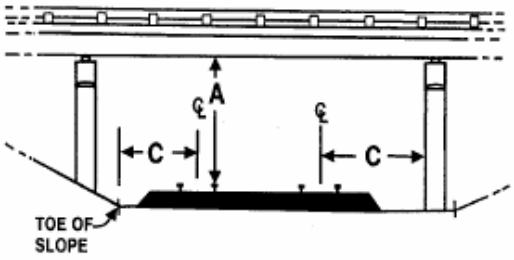
TYPICAL DIVIDED UNDERPASS WITH CENTER PIER



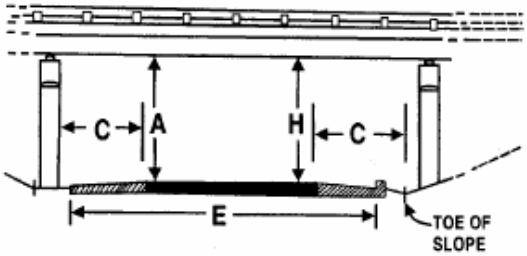
TYPICAL DIVIDED UNDERPASS WITHOUT CENTER PIER



TYPICAL RAILROAD UNDERPASS



TYPICAL UNDIVIDED UNDERPASS



ROADWAY SHOULDER

Vertical Clearance Under
For Divided Roadways Record Measurement
A = N.B. or E.B.
B = S.B. or W.B.
For Railroad under or 2-Way Road Record Measurement A

Under Clearance Lateral
For Divided Roadway Record the Lesser of Measurement
C = Right Side Clearance
D = Left Side Clearance
For Railroad under or 2-Way Road under record the lesser of measurement C

Roadway Width
For Divided Roadway
E = N.B. or E.B. Roadway
F = S.B. or W.B. Roadway

Median Width
G = Median Width from edge to edge of shoulder, curb, etc.

Maximum Vertical Clearance
H = For 10' Wide Vehicle