AASHTOWare Bridge Design and Rating Training

LIB1– Libraries (BrD/BrR 6.7)

Libraries

Library Concepts

The libraries of BrD/BrR allow for the description of items that are standardized or used frequently in the description of a bridge or by analysis events. The libraries of BrD/BrR currently define the following items:

- Steel Shapes
- Prestress Shapes
- Timber Shapes
- Factors
- Vehicles
- LRFD Substructure Design Settings
- Materials (steel, concrete, etc.)
- Appurtenances (parapets, medians, railings, etc.)
- Connectors (bolts, nails)

BrD/BrR is pre-loaded with library items selected by AASHTO. These items were taken from various sources including the following:

- *AASHTO LRFD Bridge Design Specifications*
- *AASHTO Manual for Bridge Evaluation*
- *AASHTO Standard Specifications for Highway Bridges*
- *AASHTO Standard Specifications for Transportation Materials*
- *AISC Manual of Steel Construction*
- *PCI Precast Prestressed Concrete Bridge Design Manual*

Library Types

Three types of library items:

Standard Items added to database by AASHTO. Standard library items are not editable.

Agency All items added to the library by a user.

User Defined Only available for vehicles.

Using Library Data

Two methods to use library items:

Linking Library item associated with a bridge component or analysis event. If the library item is modified then the updated data is used by the bridge component or analysis event. (Factors, Vehicles)

Copying Data from library item copied from a library item to a bridge item. A change in the library item has no effect on bridge items that use data previously copied from library item. (Steel Shapes, Prestress Shapes, Timber Shapes, Materials, Appurtenances, Connectors, Factors)

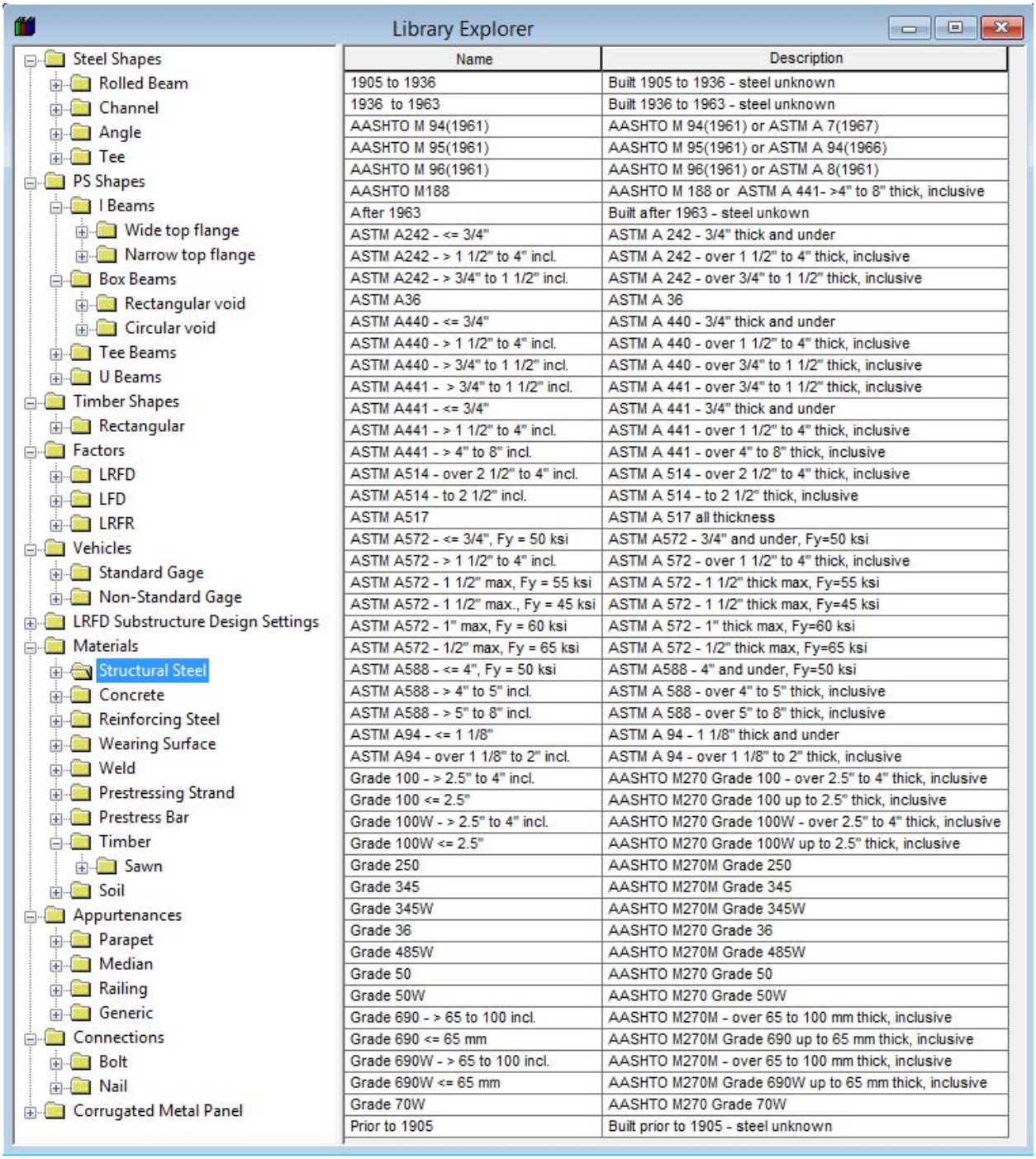
Linking is used to reduce amount of data stored in database for items that are unlikely to be modified.

Library Security

- Library access can be restricted for read, write, create, and delete access.
- Access restrictions apply to all libraries for a given user or group of users.
- Limit number of users with write, create, and delete access.
  - Reduce possibility of incorrect data.
  - Reduce duplicate items and inappropriate items.

Library Explorer

The Library Explorer is used to navigate the various libraries. The tree control in the left pane organizes the libraries. The item selected in the tree control determines the library items to be listed in the right pane of the window.

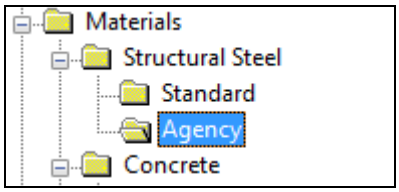


Name	Description
1905 to 1936	Built 1905 to 1936 - steel unknown
1936 to 1963	Built 1936 to 1963 - steel unknown
AASHTO M 94(1961)	AASHTO M 94(1961) or ASTM A 7(1967)
AASHTO M 95(1961)	AASHTO M 95(1961) or ASTM A 94(1966)
AASHTO M 96(1961)	AASHTO M 96(1961) or ASTM A 8(1961)
AASHTO M188	AASHTO M 188 or ASTM A 441- >4" to 8" thick, inclusive
After 1963	Built after 1963 - steel unkown
ASTM A242 - <= 3/4"	ASTM A 242 - 3/4" thick and under
ASTM A242 - > 1 1/2" to 4" incl.	ASTM A 242 - over 1 1/2" to 4" thick, inclusive
ASTM A242 - > 3/4" to 1 1/2" incl.	ASTM A 242 - over 3/4" to 1 1/2" thick, inclusive
ASTM A36	ASTM A 36
ASTM A440 - <= 3/4"	ASTM A 440 - 3/4" thick and under
ASTM A440 - > 1 1/2" to 4" incl.	ASTM A 440 - over 1 1/2" to 4" thick, inclusive
ASTM A440 - > 3/4" to 1 1/2" incl.	ASTM A 440 - over 3/4" to 1 1/2" thick, inclusive
ASTM A441 - > 3/4" to 1 1/2" incl.	ASTM A 441 - over 3/4" to 1 1/2" thick, inclusive
ASTM A441 - <= 3/4"	ASTM A 441 - 3/4" thick and under
ASTM A441 - > 1 1/2" to 4" incl.	ASTM A 441 - over 1 1/2" to 4" thick, inclusive
ASTM A441 - > 4" to 8" incl.	ASTM A 441 - over 4" to 8" thick, inclusive
ASTM A514 - over 2 1/2" to 4" incl.	ASTM A 514 - over 2 1/2" to 4" thick, inclusive
ASTM A514 - to 2 1/2" incl.	ASTM A 514 - to 2 1/2" thick, inclusive
ASTM A517	ASTM A 517 all thickness
ASTM A572 - <= 3/4", Fy = 50 ksi	ASTM A572 - 3/4" and under, Fy=50 ksi
ASTM A572 - > 1 1/2" to 4" incl.	ASTM A 572 - over 1 1/2" to 4" thick, inclusive
ASTM A572 - 1 1/2" max, Fy = 55 ksi	ASTM A 572 - 1 1/2" thick max, Fy=55 ksi
ASTM A572 - 1 1/2" max., Fy = 45 ksi	ASTM A 572 - 1 1/2" thick max, Fy=45 ksi
ASTM A572 - 1" max, Fy = 60 ksi	ASTM A 572 - 1" thick max, Fy=60 ksi
ASTM A572 - 1/2" max, Fy = 65 ksi	ASTM A 572 - 1/2" thick max, Fy=65 ksi
ASTM A588 - <= 4", Fy = 50 ksi	ASTM A588 - 4" and under, Fy=50 ksi
ASTM A588 - > 4" to 5" incl.	ASTM A 588 - over 4" to 5" thick, inclusive
ASTM A588 - > 5" to 8" incl.	ASTM A 588 - over 5" to 8" thick, inclusive
ASTM A94 - <= 1 1/8"	ASTM A 94 - 1 1/8" thick and under
ASTM A94 - over 1 1/8" to 2" incl.	ASTM A 94 - over 1 1/8" to 2" thick, inclusive
Grade 100 - > 2.5" to 4" incl.	AASHTO M270 Grade 100 - over 2.5" to 4" thick, inclusive
Grade 100 <= 2.5"	AASHTO M270 Grade 100 up to 2.5" thick, inclusive
Grade 100W - > 2.5" to 4" incl.	AASHTO M270 Grade 100W - over 2.5" to 4" thick, inclusive
Grade 100W <= 2.5"	AASHTO M270 Grade 100W up to 2.5" thick, inclusive
Grade 250	AASHTO M270M Grade 250
Grade 345	AASHTO M270M Grade 345
Grade 345W	AASHTO M270M Grade 345W
Grade 36	AASHTO M270 Grade 36
Grade 485W	AASHTO M270M Grade 485W
Grade 50	AASHTO M270 Grade 50
Grade 50W	AASHTO M270 Grade 50W
Grade 690 - > 65 to 100 incl.	AASHTO M270M - over 65 to 100 mm thick, inclusive
Grade 690 <= 65 mm	AASHTO M270M Grade 690 up to 65 mm thick, inclusive
Grade 690W - > 65 to 100 incl.	AASHTO M270M - over 65 to 100 mm thick, inclusive
Grade 690W <= 65 mm	AASHTO M270M Grade 690W up to 65 mm thick, inclusive
Grade 70W	AASHTO M270 Grade 70W
Prior to 1905	Built prior to 1905 - steel unknown

Exercise 3

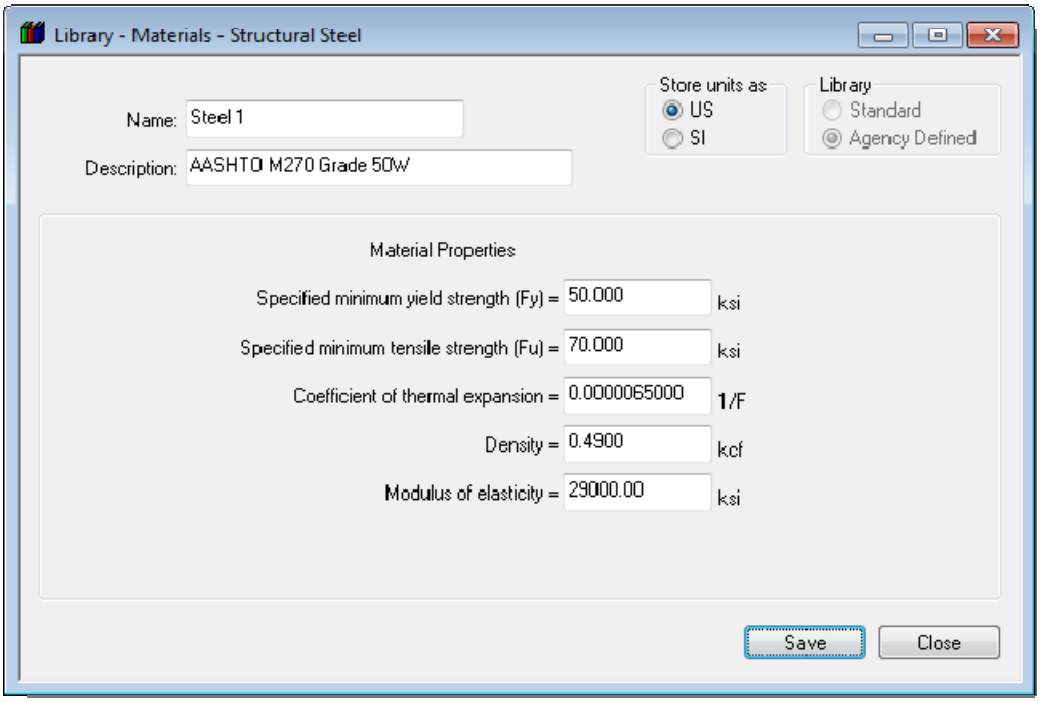
Add Steel Material Library Item

1. Select the tree item Materials/Structural Steel/Agency in the Library Explorer as shown below.



2. Select File/New from the menu. A Library – Materials – Structural Steel window will appear.

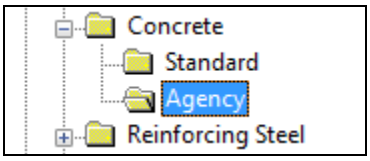
3. Select the system of units using the radio buttons and then fill in the structural steel information as shown below. Note that the name must be unique among all structural steel library items.



4. Click Save. The new structural steel material will now be listed in the right pane of the Library Explorer for the tree items Materials/Structural Steel/Agency and Materials/Structural Steel.

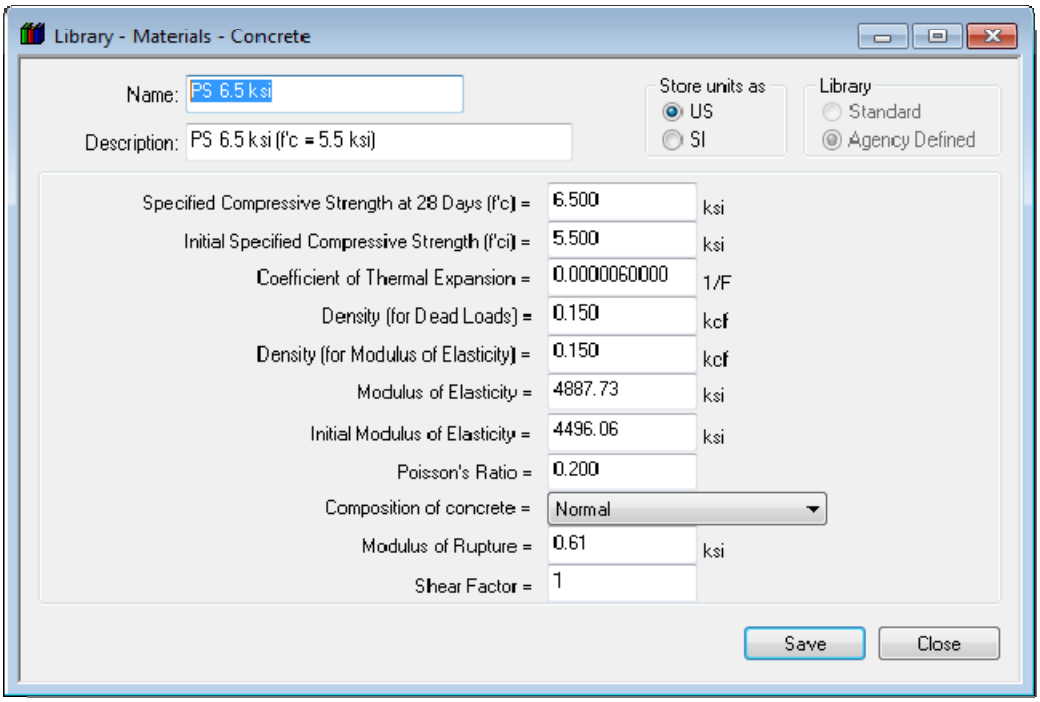
Add Concrete Material Library Item

1. Select the tree item Materials/Concrete/Agency in the Library Explorer as shown below.



2. Select File/New from the menu. A Library – Materials – Concrete window will appear.

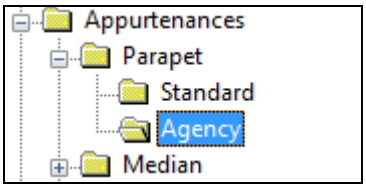
3. Select the system of units using the radio buttons and then fill in the concrete information as shown below. Note that the name must be unique among all concrete library items.



4. Click Save. The new concrete material will now be listed in the right pane of the Library Explorer for the tree items Materials/Concrete/Agency and Materials/Concrete.

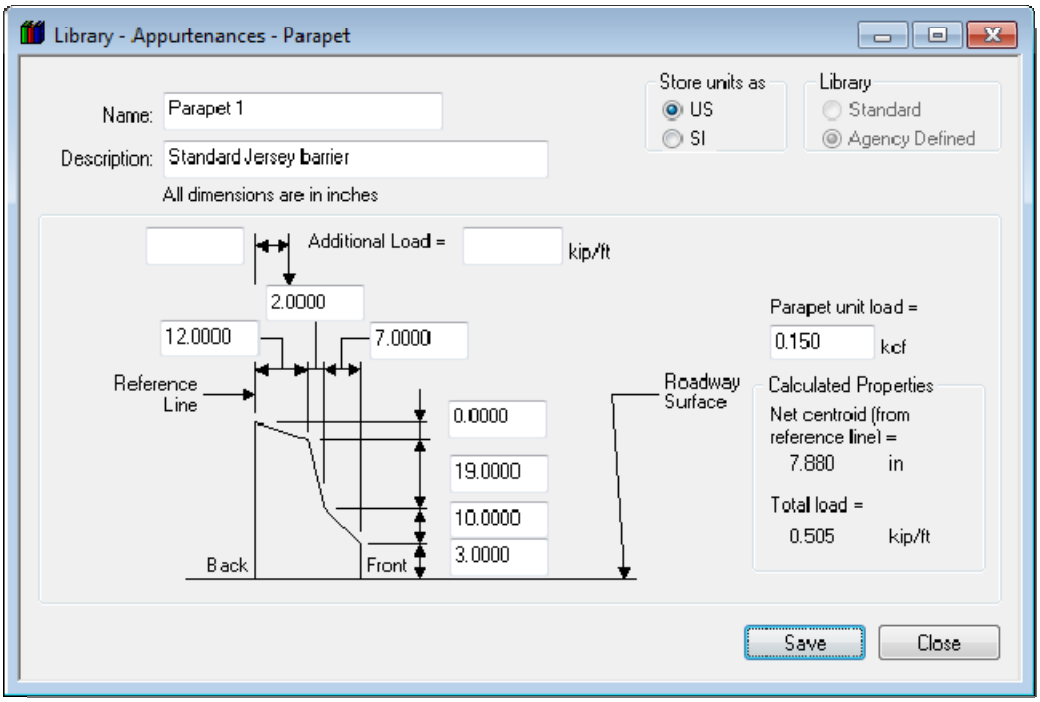
Add Parapet Library Item

1. Select the tree item Appurtenances/Parapet/Agency in the Library Explorer as shown below.



2. Select File/New from the menu. A Library – Appurtenances – Parapet window will appear.

3. Select the system of units using the radio buttons and then fill in the parapet information as shown below. Note that the name must be unique among all parapet library items.

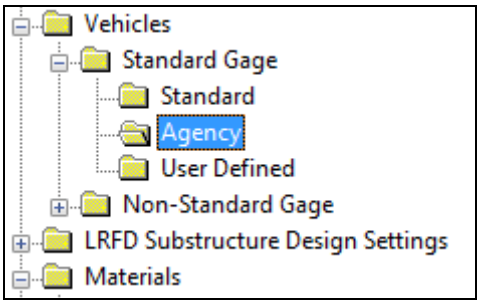


4. Click Save. The new parapet will now be listed in the right pane of the Library Explorer for the tree items Appurtenances/Parapet/Agency and Appurtenances/Parapet.

Add Vehicle Library Item

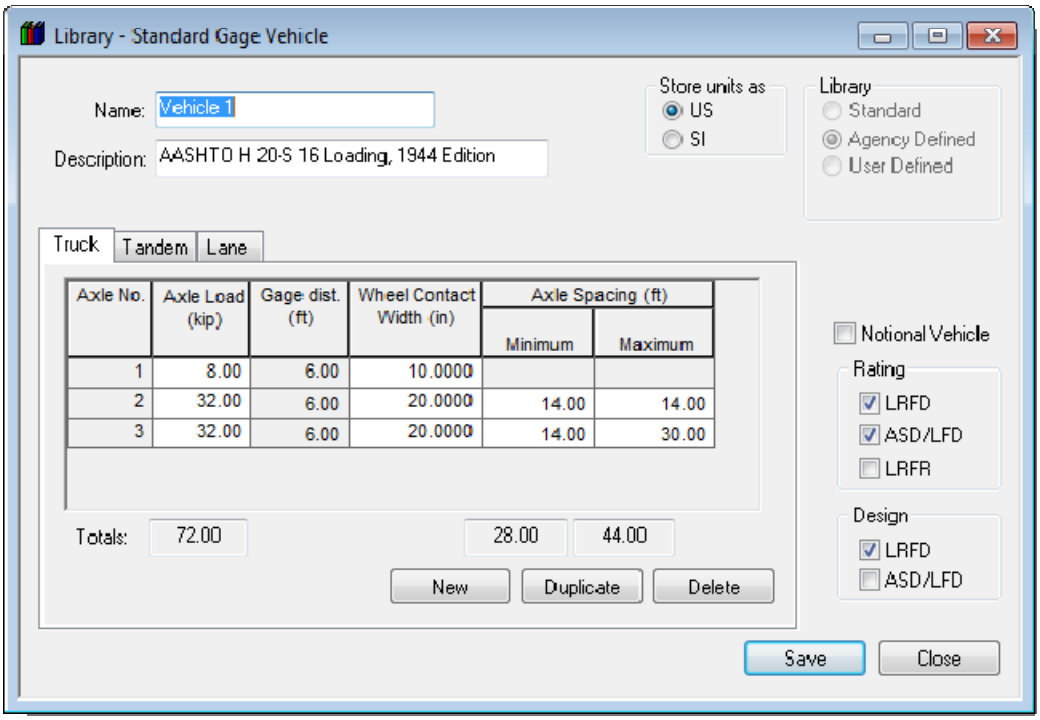
The Vehicle Library now has a new library type called 'User Defined'. This library allows users to add their own vehicles.

1. Select the tree item Vehicles/Standard Gage/Agency in the Library Explorer as shown below.



2. Select File/New from the menu. A Library – Vehicle window will appear.

3. Select the system of units using the radio buttons and then fill in the vehicle information as shown below for all items not on the tab control. Note that the name must be unique among all vehicle library items. The checkboxes inside the Design and Rating groups are used to filter the vehicle during an analysis event based on the type of event and the type of analysis engine selected.



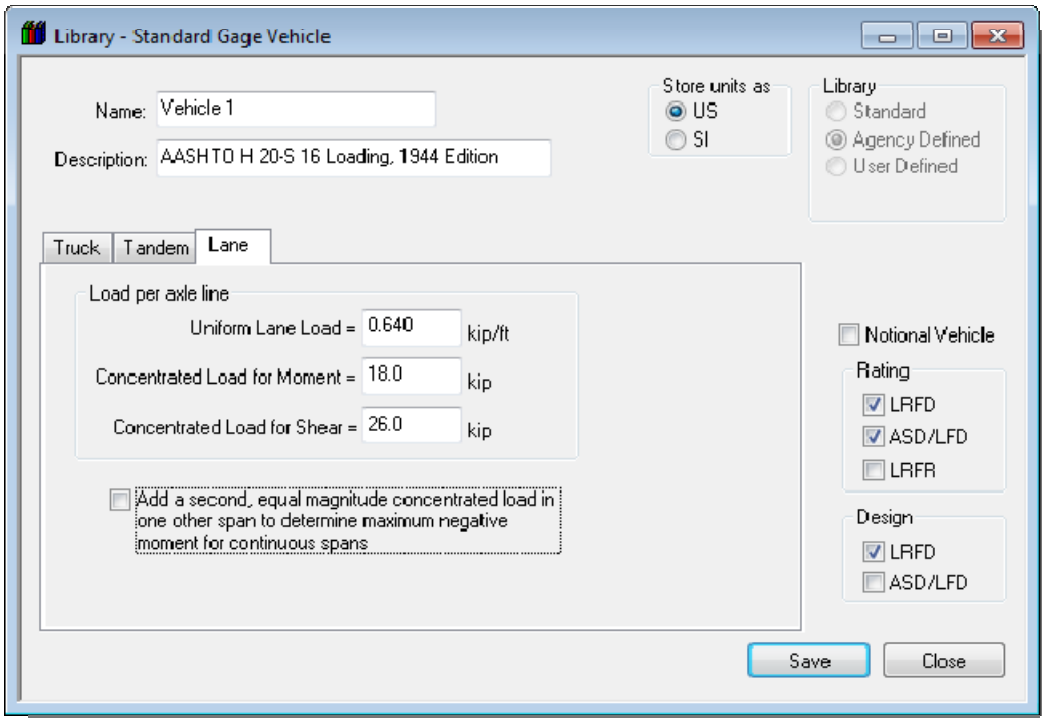
4. Click the New button to add an axle to the vehicle.

5. Enter the first axle's dimensions. (Axle spacing is not applicable for the first axle.)

6. Repeat steps 4 and 5 for each additional axle.

7. Select the Lane Tab.

8. Enter data on the Lane tab as shown below.



9. Click Save. The new vehicle will now be listed in the right pane of the Library Explorer for the tree items Vehicles/Standard Gage/Agency and Vehicles.