

SADES

Statewide Asset Data Exchange System

Data Collection Specifications Guide



Culverts and Closed Drainage Systems (CCDS)

Inlets
Outlets
Pipes
Drainage Structures

Partnership with:

NH Department of Transportation (NHDOT)
UNH Technology Transfer Center (UNH T²)

General User Information

It is recommended that data be collected using the ESRI Collector Application for the Apple iPad.

Additional recommended equipment for conducting the assessment includes:

Tape Measure

Personal Protective Equipment

If you have questions or concerns about this iPad application or the SADES CCDS collection program, please contact the UNH Technology Transfer Center.

Contact Information:

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SADES Manager

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Office: (603) 862-5489

Inlets

Date Inspected

User Input Date

Record the date the inspection is performed.

End Treatment Type

Headwall (no wingwalls)

Headwall (with wingwalls)




Flared End Section


Other

None

Select one type of end treatment present at the inlet. See below for examples and definitions for each type:




See table on next page





Type	Definition	Example
<p>Headwall (No Wingwalls)</p>	<p>There is a headwall structure around the pipe, but no presence of wingwalls</p>	
<p>Headwall (With Wingwalls)</p>	<p>There is a headwall structure around the pipe, with wingwalls extending to the sides</p>	
<p>Flared End Section</p>	<p>Commonly referred to as a “Dust Pan”, and is attached to the pipe. The flared end section may be different material than the pipe.</p>	


Other	An end treatment that does not fit into a category above. Please note end treatment observations in “Inspector Comments” section.	
None	An end treatment does not exist at the inlet location, and the pipe or culvert is left exposed on the slope. This includes pipes that have been physically cut or mitered to match the slope.	

Material Type
Metal
Concrete
Masonry
Gabion
Plastic
Other
N/A

Select one material type of the inlet from the drop down menu. See below for examples and definitions of each:

End Treatment	Description	Example
Headwall (with or without wingwalls)	Metal- continuous metal walls, whether smooth or corrugated.	
	Concrete- preformed or cast in place concrete walls.	
	Masonry- brick or stone structure	

	<p>Gabion- wire cages filled with small stones that stack on one another to form a wall.</p>	
	<p>Other- a material not listed above.</p>	
<p>Flared End Section</p>	<p>Metal – formed sheet metal, typically attached to the pipe using metal banding.</p>	
	<p>Concrete – a precast unit, typically at the end of a concrete pipe.</p>	
	<p>Plastic – molded plastic, typically attached to plastic pipes using metal banding.</p>	
	<p>Other- a material not listed above.</p>	

N/A	If there is no end treatment present, <u>please select N/A.</u>	
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Inlet Condition










Good

Fair

Poor

No Rating

Record the condition of the inlet. See below for examples and definitions for each condition state.

Condition	Good	Fair	Poor
Description	Some wear, with little or no deterioration, consistent shape, minor joint misalignment, no movement, structurally sound	Some deterioration or cracking, joint separation with minor infiltration but structurally sound, localized distortion in shape	Significant deterioration or extensive cracking and/or spalling, extreme deflection in shape, joint separation with potential to create voids, or significant movement
Concrete Example			
Masonry Example			
Flared End Section Example			

Please see next page for important notes on Inlet condition.

Inlet Condition Notes:

- Condition rating is required for all features
- Comment is required for features receiving a condition rating of “Poor”.
- For features in extremely poor condition (may cause collapse of the roadway or other danger to data collection crews or maintenance crews) notify the data collection supervisor.
- “No Rating” shall be used in cases that the feature cannot be rated (cannot be found or seen).
- Features filled with concrete or otherwise abandoned should receive a comment, “ABANDONED”.

Inlet Condition with No End Treatment Type

Good	Poor
	
	
	

Needs Maintenance

Yes

No

Select “Yes” if any of the following apply:

- Debris blocking the inlet
- Vegetation impacting the function of the inlet
- Minor erosion around or under the inlet

Comment is required if “Yes” is selected.

Inspector Comments

User Input Text

Record any comments regarding the inspection of the inlet. For features receiving a condition rating of “Poor”, or when selecting “Other” for any options, please provide a comment.

Inlet Notes:

- For multiple-inlet locations (such as multiple culverts running parallel from a single headwall), collect each culvert opening as a separate inlet slightly offset from each other.

Outlets

Date Inspected

User Input Date

Record the date the inspection is performed.

End Treatment Type

Headwall (no wingwalls)

Headwall (with wingwalls)




Flared End Section


Other

None

Select one type of end treatment present at the outlet. See below for examples and definitions for each type:




See table on next page





Type	Definition	Example
<p>Headwall (No Wingwalls)</p>	<p>There is a headwall structure around the pipe, but no presence of wingwalls</p>	
<p>Headwall (With Wingwalls)</p>	<p>There is a headwall structure around the pipe, with wingwalls extending to the sides</p>	
<p>Flared End Section</p>	<p>Commonly referred to as a “Dust Pan”, and is attached to the pipe. The flared end section may be different material than the pipe.</p>	


<p>Other</p>	<p>An end treatment that does not fit into a category above. Please note end treatment observations in “Inspector Comments” section.</p>	
<p>None</p>	<p>An end treatment does not exist at the outlet location, and the pipe or culvert is left exposed on the slope. This includes pipes that have been physically cut or mitered to match the slope.</p>	

Material Type
Metal
Concrete
Masonry
Gabion
Plastic
Other
N/A

Select one material type of the outlet from the drop down menu. See below for examples and definitions of each:

End Treatment	Description	Example
Headwall (with or without wingwalls)	Metal- continuous metal walls, whether smooth or corrugated.	
	Concrete- preformed or cast in place concrete walls.	
	Masonry- brick or stone structure	

	<p>Gabion- wire cages filled with small stones that stack on one another to form a wall.</p>	
	<p>Other- a material not listed above.</p>	
<p>Flared End Section</p>	<p>Metal – formed sheet metal, typically attached to the pipe using metal banding.</p>	
	<p>Concrete – a precast unit, typically at the end of a concrete pipe.</p>	
	<p>Plastic – molded plastic, typically attached to plastic pipes using metal banding.</p>	
	<p>Other- a material not listed above.</p>	

N/A	If there is no end treatment present, <u>please select N/A.</u>	
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Outlet Condition










Good

Fair

Poor

No Rating

Record the condition of the outlet. See below for examples and definitions for each condition state.

Condition	Good	Fair	Poor
Description	Some wear, with little or no deterioration, consistent shape, minor joint misalignment, no movement, structurally sound	Some deterioration or cracking, joint separation with minor infiltration but structurally sound, localized distortion in shape	Significant deterioration or extensive cracking and/or spalling, extreme deflection in shape, joint separation with potential to create voids, or significant movement
Concrete Example			
Masonry Example			
Flared End Section Example			

Please see next page for important notes on Outlet Condition.

Outlet Condition Notes:

- Condition rating is required for all features
- Comment is required for features receiving a condition rating of “Poor”.
- For features in extremely poor condition (may cause collapse of the roadway or other danger to data collection crews or maintenance crews) notify the data collection supervisor.
- “No Rating” shall be used in cases that the feature cannot be rated (cannot be found or seen).
- Features filled with concrete or otherwise abandoned should receive a comment, “ABANDONED”.

Outlet Condition with No End Treatment Type

Good	Poor
	
	
	

Needs Maintenance

Yes

No

- Select “Yes” if any of the following apply:
 - Debris blocking the outlet
 - Vegetation impacting the function of the outlet
 - Minor erosion around or under the outlet

Comment is required if “Yes” is selected.

Inspector Comments

User Input Text

Record any comments regarding the inspection of the outlet. For features receiving a condition rating of “Poor”, or when selecting “Other” for any options, please provide a comment.

Outlet Notes:

- For multiple-outlet locations (such as multiple culverts running parallel from a single headwall), collect each culvert opening as a separate outlet slightly offset from each other.

Pipes

Date Inspected

User Input Date

Record the date the inspection is performed.

Material Type

Plastic

Metal

Concrete

Masonry

Other

Select one material type of the pipe from the drop down menu. See below for examples of each:



Plastic



Metal












Concrete



Masonry

Pipe Condition
Good
Fair
Poor
No Rating

Record the condition of the pipe. See below for examples and definitions for each condition state.

Condition	Good	Fair	Poor
Description	Some wear, with little or no deterioration, consistent shape, minor joint misalignment, no movement, structurally sound	Some deterioration or cracking, joint separation with minor infiltration but structurally sound, localized distortion in shape	Significant deterioration or extensive cracking and/or spalling, extreme deflection in shape, joint separation with potential to create voids, or significant movement
Concrete Example			
Metal Example			
Plastic Example			

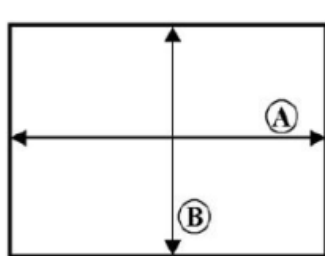
Please see next page for important notes on Pipe Condition.

Pipe Condition Notes:

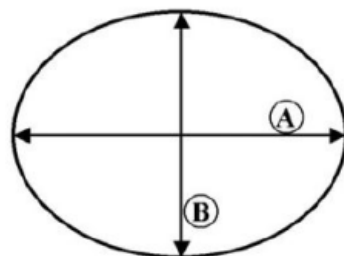
- Condition rating is required for all features
- For features receiving a condition rating of “Poor”, please provide a comment
- For features in extremely poor condition (may cause collapse of the roadway or other danger to data collection crews or maintenance crews) notify the data collection supervisor.
- “No Rating” shall be used in the case that the feature cannot be rated (cannot be found or seen).
- Features filled with concrete or otherwise abandoned should receive a comment, “ABANDONED”.

Pipe Shape
Full Box
Open Bottom Box
Embedded Box
Elliptical
Embedded Elliptical
Round
Embedded Round
Open Bottom Arch
Full Arch
Embedded Arch

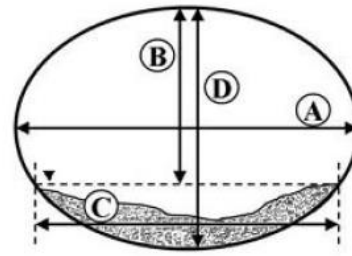
Record the shape of the pipe. See below for examples of each:



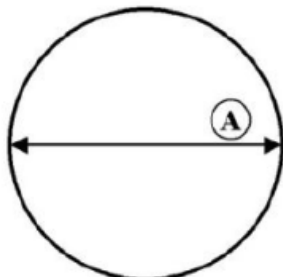
Box Culvert



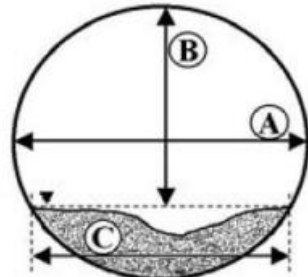
Elliptical Culvert



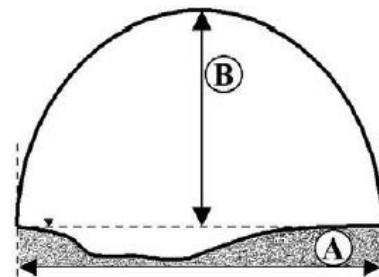
Embedded Elliptical Culvert



Round Culvert



Embedded Round Culvert



Open Bottom Arch

Note:

1. For other shapes not shown, follow guidance listed under Pipe Dimension attribute instructions.

Pipe Dimension A (inches)

User Input Number

Record the width of the culvert at its widest point (diameter for round pipes) to the nearest inch.

Pipe Dimension B (inches)

User Input Number

Record the height of the culvert (if embedded, measure from stream bed) to the nearest inch.

Pipe Dimension C (inches)

User Input Number

Record the width of the stream bed within embedded culvert to the nearest inch.

Pipe Dimension D (inches)

User Input Number

Record the full pipe height in embedded culvert to the nearest inch.

Height of Fill

0-2'

2'-5'

5'-10'

10-20'

20'+

Select one option that best describes the maximum fill height above the pipe, measured from the top of pipe to the finished surface above the pipe.

Category Type

Roadway (default)

Driveway

Airport

Railroad

Trail

Other

Select which type of category the pipe is associated with.

Connects to Other System

Yes

No

Select "Yes" or "No" whether or not the pipe is connected to another drainage system.




For pipe locations that connect to other drainage systems: draw a short line in the general direction of flow to represent the pipe feature, then select "Yes" for this option. Collect data in all other fields as necessary.


Rehabilitated Pipe

Yes

No

Select “Yes” or “No” whether or not there appears to be any attempted lining or extension of the pipe. See below for examples. Please provide a picture showing the rehabilitation if possible, and a comment on the type of rehabilitation. For your reference, some potential types of rehabilitation have been provided below:

Possible Rehabilitation Types	Description	Example
<p>Slip Lining</p>	<p>A smaller diameter pipe installed by sliding or “slipping” into a larger diameter pipe. The space between the two pipes is typically filled with grout, and conduit used for injecting grout may be visible at inlet/outlet ends. The two pipes can be of different materials.</p>	
<p>Spray-On Lining</p>	<p>Cementitious or polymer material is sprayed onto existing pipe walls to seal any small cracks and provide better water flow through the pipe. Outside wall of the pipe could be any material, the inside walls will look like concrete.</p>	
<p>Close-Fit Lining</p>	<p>Fiberglass or plastic lining material is forced against existing pipe walls and left to harden. The result is a lining that closely conforms to the existing pipe shape, but seals off any cracks or voids in the pipe and provides better water flow.</p>	

Invert Lining	Similar to rehabilitation types described above, however only up to the bottom 2/3 of the pipe may be rehabilitated.	
Pipe Extension	An existing pipe of one material type is lengthened using a different material type.	

Needs Maintenance
Yes
No

Select "Yes" if any of the following apply:

- Debris in pipe
- Sediment in pipe
- Beaver dam in pipe

If "Yes" is selected, please leave a comment describing observations.

If none of the above apply, select "No".

Inspector Comments
User Input Text

Record any comments regarding the inspection of the pipe. For features receiving a condition rating of "Poor", or when selecting "Other" for any options, please provide a comment.

Pipe Notes:

- For Closed Drainage Systems (underground pipes between structures) – Enter as much information as can be obtained from visual inspection from ground level. Estimated dimensions are sufficient.
- When unable to view pipe directly, choose “No Rating” for Pipe Condition field in order to indicate that the pipe was visited, and then please leave a comment as to why no condition rating was given.
- Features filled with concrete or otherwise abandoned should receive a comment, “ABANDONED”.
- Leave “Needs Maintenance” field blank if unable to view pipe directly.
- Pipes should be drawn in the direction of water flow, from the upstream (inlet) end toward the downstream (outlet) end, if possible and if the direction can be determined in the field.
- For multiple-pipe locations (such as multiple culverts running parallel), collect each pipe as a separate feature slightly offset from each other.

Drainage Structures

Date Inspected

User Input Date

Record the date the inspection is performed.

Drainage Structure Type

Catch Basin

Drop Inlet

Manhole

Select one drainage structure type from the drop down menu. See below for examples of each:



Catch Basin or Drop Inlet



Manhole

Material Type



Precast Concrete

Barrel Block

Other

Select one material type from the drop down menu. For manholes, leave this field blank.

See next page for examples and definitions of each.

Material Type	Description	Example
Precast Concrete	Structure walls are made from large concrete rings stacked on top of each other.	
Barrel Block	Structure walls are made from concrete blocks, similar to cinder blocks.	
Other	Structure walls are made from any other material, or a combination of materials.	

Drainage Structure Condition




Good

Fair

Poor

No Rating

Record the condition of the drainage structure. See below for examples and definitions for each condition state.

Condition	Good	Fair	Poor
Description	Some wear, with little or no deterioration, consistent shape, minor joint misalignment, no movement, structurally sound	Some deterioration or cracking, joint separation with minor infiltration but structurally sound, localized distortion in shape. Sinkholes developing near structures may also note a problem with the structure condition.	Significant deterioration or extensive cracking and/or spalling, extreme deflection in shape, joint separation with potential to create voids, or significant movement. Sinkholes developing near structures may also note a problem with the structure condition.
Example			

Drainage Structure Notes:

- Condition rating is required for all features.
- For features receiving a condition rating of “Poor”, please provide a comment.
- For features in extremely poor condition (may cause collapse of the roadway or other danger to data collection crews or maintenance crews) notify the data collection supervisor.
- “No Rating” shall be used in the case that the feature cannot be rated (cannot be found or seen)

- Features filled with concrete or otherwise abandoned should receive a comment, “ABANDONED”.

Needs Maintenance

Yes

No

Select “Yes” if any of the following apply:

- Debris in structure or covering grate
- Significant amount of sediment in structure
- Cracked metal grate or cover
- Grate or cover frame does not sit flush with pavement (either noticeably high or low)

If “Yes” is selected, please leave a comment describing observations.

If none apply, select “No”.

Inspector Comments

User Input Text

Record any comments regarding the inspection of the drainage structure. For features receiving a condition rating of “Poor”, or when selecting “Other” for any options, please provide a comment.

MS4 Action Date

User Input Date

Record the date of any MS4 required cleaning or inspection (sump cleaning with vacuum trucks). For maintenance use only.

Photograph Guide

Inspection Date

User Input Date

Record the date the pictures were taken.

Asset Type

Inlet

Outlet

Pipe

Drainage Structure

Select one asset type from the drop down menu that describes the subject of the photo(s).

Inspector Comments

User Input Text

Record any comments regarding the asset photo.

Photo Notes:

- Please take photos of all inspected features when possible (Only attach photos of one asset type to a single photo 'point'). Multiple photos of the same asset can be attached to the same point.
- For photos of drainage structures with grates (catch basins or drop inlets) attempt to take photos of both the grate viewed from ground level (to include curbing, guardrail, or other roadside features), as well as photos inside the structure looking through the grate.
- For locations that are overgrown, or somewhat buried in the slope, a paint stripe across the top of the feature or use of a folding ruler to point at the feature is extremely helpful.
- If pipe is safely accessible, and taking photos in pipe does not cause issues with the data collection equipment, please take pictures of the inside of pipes as well as any exposed part of the outside of the pipes.
- If possible, mark the subject of the photo (inlet, outlet, pipe, or drainage structure) with paint to make the subject easier to identify.