



# Alaska Department of Transportation & Public Facilities

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## Retaining Wall Inventory Procedures Manual



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## INTRODUCTION

This draft document provides a description of procedures and guidelines for a preliminary inventory of earth retaining structures along routes that are owned and/or maintained by AKDOT&PF.

The **Retaining Wall Inventory (RWI)** is just one component of the Department's Retaining Wall Management Program (RWMP), which in effect represents a sub-program of the umbrella Geotechnical Asset Management Program (GAMP). The RWI relies on an office based survey of internal records to catalogue wall type, locations, and other basic data for earth retaining structures meeting acceptance criteria described in this manual.

Starting with this baseline inventory of retaining wall assets within the route network, the Department is proceeding with the next step in the asset management process: condition assessment and performance modeling. As of January 2017, 400+ of the total 1,300+ walls documented in the RWI have been rated for physical condition, using a system developed for asset management purposes. Scores assigned in a series of categories assessing various characteristics are tallied into Hazard and Risk scores; these are synthesized down to a simplified 5-division (1 through 5) condition state rating, and ultimately condensed down to Good-Fair-Poor categories. The rating system for walls (as well as for the other asset classes targeted within the GAMP – rock slopes, unstable soil slopes and embankments, and material sites) is introduced briefly in the GAM Program Overview online at:

<http://akdot.maps.arcgis.com/apps/MapJournal/index.html?appid=15ca1b0297e94ad386c01cc459851ee8>

Condition rating systems are described in detail in the draft research report *Statewide Geotechnical Asset Management Program Development* (April 2016):

[http://ancedocs-ucm.dot.state.ak.us/anc-dot-edocs/groups/design\\_public/documents/reports/dot-anc\\_113686.pdf](http://ancedocs-ucm.dot.state.ak.us/anc-dot-edocs/groups/design_public/documents/reports/dot-anc_113686.pdf)

It is important for the user of this manual to keep in mind that it applies specifically to the baseline wall inventory (RWI), and does not address condition assessment. It is also critical to know that the condition rating system for retaining walls in the GAMP is for asset management purposes; such a rating for any particular wall in the RWI does not serve as an engineering assessment and is not adequate for design purposes.

**Personnel working on the RWI should follow this basic sequence of steps:**

- 1. Read and become familiar with the information in this manual.**
- 2. Gather/locate/access internal records sources. [SEE DATA SOURCES](#)**
- 3. Apply the general acceptance criteria to determine if a wall or other retaining structure should be included in the inventory. [SEE WALL ACCEPTANCE CRITERIA](#)**
- 4. Generate a point for each structure found by plotting the location in GIS:  
\\dotatufs03\des\GEOTECH SRVCS\\_1 ASSET MGMT\\_1 GAM\\_1 RETAINING  
WALL MGMT\Retaining Walls MXD. [SEE WALL DATABASE](#)**

5. Input information to the appropriate data fields in the database.  
**SEE DATA FIELDS**
6. Update the Retaining Wall Inventory in AGOL (ArcGIS Online):  
<http://services.arcgis.com/r4A0V7UzH9fcLVvv/arcgis/rest/services/RetainingWallInventory/FeatureServer>

## WALL TERMINOLOGY AND APPLICATIONS

For the purposes of this inventory, the terms *earth retaining system*, *earth retaining structure*, and *retaining wall* are used interchangeably.

An earth retaining system (ERS) is defined as “*any structure intended to stabilize an otherwise unstable soil mass by means of lateral support or reinforcement*” (FHWA, 1997). Retaining walls, which have a vertical or near vertical face, are by far the most familiar type of ERS

For highway applications, the most common uses of retaining walls are for grade separations, bridge abutments, slope stabilization, and excavation support.

Because one of the principal goals of the inventory phase of the State’s Retaining Wall Management Program is to classify the walls, **significant emphasis is placed upon identifying – for each wall in the inventory – the wall category, wall function (application), and wall type.**

## WALL ACCEPTANCE CRITERIA

The wall inventory to be completed within the AKDOT&PF Retaining Wall Management Program (RWMP) will result in the identification and cataloguing of most retaining walls owned and/or maintained by AKDOT&PF.

**Use these criteria for determining if a wall qualifies for the inventory:**

- Serves as an earth retention structure;
- Was constructed in a AKDOT&PF project, is owned and/or maintained by AKDOT&PF, and currently supports a road or roadway feature that is owned and/or maintained by AKDOT&PF;
- Total wall height is  $\geq 2\text{ft}$  (except for culvert headwalls, for which the minimum total height is 6 ft);
- Face (batter) angle  $\geq 45^\circ$ .

Applying the set of criteria listed above results in the exclusion of some walls. Sound walls, for instance, would not be counted since they don't retain earth.

Many of the state's seawalls would not qualify, as many are not coupled with a roadway asset. Similarly, a bulkhead structure that is designed to protect a dock or wharf would not be captured in the RWI.

The specification for height of culvert headwalls is proposed as a means to limit the capture of headwalls that serve more primarily in support of the culvert, rather than to retain embankment fill. The goal is to capture a majority of culvert headwalls that are critical to embankment stability, and to reduce the instances of "double capture," where in a headwall is inventoried within two programs - the RWI as well as in a preliminary culvert inventory managed by M&O division of the agency. (Note: a previous statewide culvert inventory was not completed and was suspended. We do, however, anticipate that the Department will pursue future inventory efforts specific to the culvert asset class).

The criterion regarding face angle is meant to allow for capture of retaining structures that are not "walls." In fact, the FHWA defines a retaining wall as having an internal face angle greater than or equal to 70°. As we want, however, to allow for capture of structures such as rockeries, soil nail walls, and reinforced soil slopes (RSS), the face angle criterion has been set at  $\geq 45^\circ$ .

If the inventory worker is in doubt regarding the qualifications of a particular retaining structure for inclusion in the RWI, they should error on the conservative side and include the wall. It should be kept in mind that this is a baseline inventory only. Selected walls in the inventory will later be inspected in the field, and scored for a condition rating. Such a condition rating is a primary requirement for applying transportation asset management (TAM) processes, ultimately aimed at repair or replacement of failing and high risk structures and treatments reflecting optimized life cycle cost benefit.

## ASSIGNMENT OF WALL IDENTIFICATION

Undoubtedly, there are cases that will be problematic and challenging as far as wall qualification and/or identification. There will be questions regarding details that relate to route assignment, construction, wall type classification, or other aspects that have not yet been fully characterized. A few special cases are discussed below.

A tiered wall system features a vertical arrangement of two or more walls supporting a slope, with a setback or unsupported area between the top of one wall and the base of the wall above it. The policy proposed for the RWI is to identify the tiered wall system as one wall, with one ID.

Paired walls, e.g., culvert headwalls at outlets on opposite road sides, are assigned a unique point/wall ID for each side.

Similarly, we anticipate questions regarding wall segmentation and grouping at bridge sites or overcrossings. Statewide Materials Section is working with Bridge Section to establish coordination between the programs. The Bridge Section is responsible for designing non-proprietary walls  $\geq 4$  ft tall. More importantly, with respect to the RWI, the AKDOT Bridge

Section has been required by the federal government to maintain an inventory and rigorous inspection regimen for bridge structures.

To avoid inventory and inspection redundancy between programs, personnel compiling RWI data should **disregard bridge abutment walls** and the portions of monolithic wing walls situated within the *Bridge Zone Limits* (see discussion under *Wall Category* in the manual section *WALL CLASSIFICATION DATA*). Although portions of wing walls connected directly to bridge abutments are captured by the Bridge Management Section, there are cases of extremely long walls that are not captured at their distal portions. It is these distal portions that are to be targeted specifically for inclusion in the RWI.

## WALL DATABASE

**If the retaining structure being considered meets – or if the structure MIGHT meet – the general acceptance criteria, the data collector can proceed with inputting data for the structure into the RWI, via ArcGIS.**

For each wall, the data collector creates a point in the Retaining Wall Inventory shapefile which lies in ArcDesktop. Point activation assigns a unique record number (objectID) and displays a table with a set of data fields to be filled out manually. The **data fields and data dictionary** are listed in **TABLE 1**. Additional explanations are provided below in the section *Data Fields*.

## DATA SOURCES

Data input to the RWI relies on gathering information from relevant records available internally and/or online, as opposed to direct reconnaissance and observation in the field. Sources for data, records, or helpful related information may include – but are not limited to – the following:

- As-builts stored in eDocs (centralized document management system for AKDOT&PF):  
<http://web.dot.state.ak.us/eDocs/index.shtml>
- As-builts for Southcoast Region: <http://dot.alaska.gov/sereg/asbuilts/index.shtml>
- As-builts from Central Region Server: \\dotatufs04\crm\Projects\Central\Hwy\
- Final construction project records.
- Road viewers, e.g. Google Street View®, or
- AKDOT& PF *Digital Roadway Viewer Alaska*  
[web.dot.state.ak.us/stwdplng/GIS/drvak.shtml](http://web.dot.state.ak.us/stwdplng/GIS/drvak.shtml)
- Roadway Information Portal (RIP)  
[web.dot.state.ak.us/stwdplng/GIS/rip.shtml](http://web.dot.state.ak.us/stwdplng/GIS/rip.shtml)

- *BidtabIV*, the computer program and database used by AKDOT & PF for storage and retrieval of construction project bid tabulations. [note: *Bidtab IV* system use is to be replaced by AASHTOWARE, beginning in 2018]
- Bridge inventory/PONTIS;
- Bridge section inventory of state owned minor structures (culverts with diameter 10-20 ft and separated pedestrian structures adjacent to public highways);
- Compilation of Bids (COB) sheets.

## DATA FIELDS

This section of the manual serves as a data dictionary and provides explanations for the set of data fields within the inventory database. Refer also to Table 1, for a tabular summary of the data fields.

### **GENERAL DATA**

#### ***Preliminary Inventory Record ID***

At this time, the unique identifier number for a wall in the RWI corresponds with the number generated automatically in ArcDesktop. The wall ID is the objectID which is generated each time a new point is created in the Retaining Wall Inventory geodatabase. [NO INPUT NECESSARY]

A final, unique ID number will eventually be assigned to each wall entered into the RWI. The numbering scheme may include coding associated with wall type, route number, and position with respect to the roadway; or else a simpler (four-digit) series similar to the bridge numbering convention used by AKDOT&PF Bridge Section.

#### ***Log Entry By (ICreateT)***

Name of person creating the original inventory record for a wall.

#### ***Log Entry Date (IDateT)***

Date of original input of data for a wall.

This date should remain as an original record creation date, not to be revised when a minor addition or retraction of data is done at a subsequent date.

#### ***Log Edit By (IEditT)***

Name of person editing the inventory record of a wall.

**Log Revision Date (*IDEditT*)**

Enter date of subsequent changes to the wall record.

**Data Source(s) (*IDataScT*)**

For purposes of the preliminary inventory, these include paper or digital records maintained by AKDOT &PF, or perhaps other agencies (for walls along routes maintained by – but not owned by – State of Alaska). Examples of possible data sources containing information related to retaining walls were listed on previous pages of this manual.

The *eDOCS* system should be checked, as the State’s existing comprehensive document management database. However, input to that system is not consistent among the agency’s divisions/sections. Many of the relevant records, therefore, will likely not yet be accessible through the *eDOCS* system.

**State Project Number (*IAKSASNN*)**

State (AKSAS) project number for the construction project that created the wall.

In cases where walls were replaced or rehabilitated, use the project number associated with the existing wall, rather than the number of the project that constructed the original wall.

**Federal Project Number (*IFedPrjT*)**

Federal project number for the construction project that created the wall.

**Construction As-Built Date (*IConstDN*)**

Use the official date of the final As-Built document as the approximate date of wall construction.

## **LOCATION DATA**

**AKDOT & PF Region (*IRegionT*)**

Specify the DOT region where the wall is located – Northern, Central, or Southcoast Region.

**Route Name (CDS) (*IHwyNamT*)**

Official route name in the *Coordinated Data System*, as assigned by the Transportation Information Group, within the Program Development Division of AKDOT&PF.

**Route Number (CDS) (*ICDSRtNN*)**

Official route number in the *Coordinated Data System*, as assigned by the Transportation Information Group, within the Program Development Division of AKDOT&PF.

**Route Milepoint (CDS) (ICDSMPN)**

Milepoint location of where the wall is at the midpoint (to 0.1) along route.

Note that the milepoint does not necessarily equate with the posted milepost (MP).

**Route Milepost (IHwyMPN)**

Milepost location of where the wall is at the midpoint (to 0.1) along the route.

This information is to be extracted from the TGIS layer mileposts using collected Mandli Lidar data.

**Offset (ft) (IOffsetT)**

Offset distance from route centerline, in feet.

**Offset Left/Right (IOsetLRN)**

Offset from route centerline, direction left or right (view straight ahead is the direction of increasing milepoint).

## **WALL CLASSIFICATION DATA**

**Wall Category [AK DOT&PF] (IWCatgrT)**

A classification related to allocation of responsibility for design of retaining walls to the Department Regional sections, Statewide Bridge Section, or Statewide Materials Section. This system of categorization closely follows the system used by Oregon DOT.

The field menu selection list includes these categories (described in the following paragraphs):

*Bridge Abutment (Br\_Abt)*

*Bridge Zone Retaining Wall (Br\_Ret)*

*Highway Retaining Wall (H\_Ret)*

*Minor Retaining Wall (M\_Ret)*

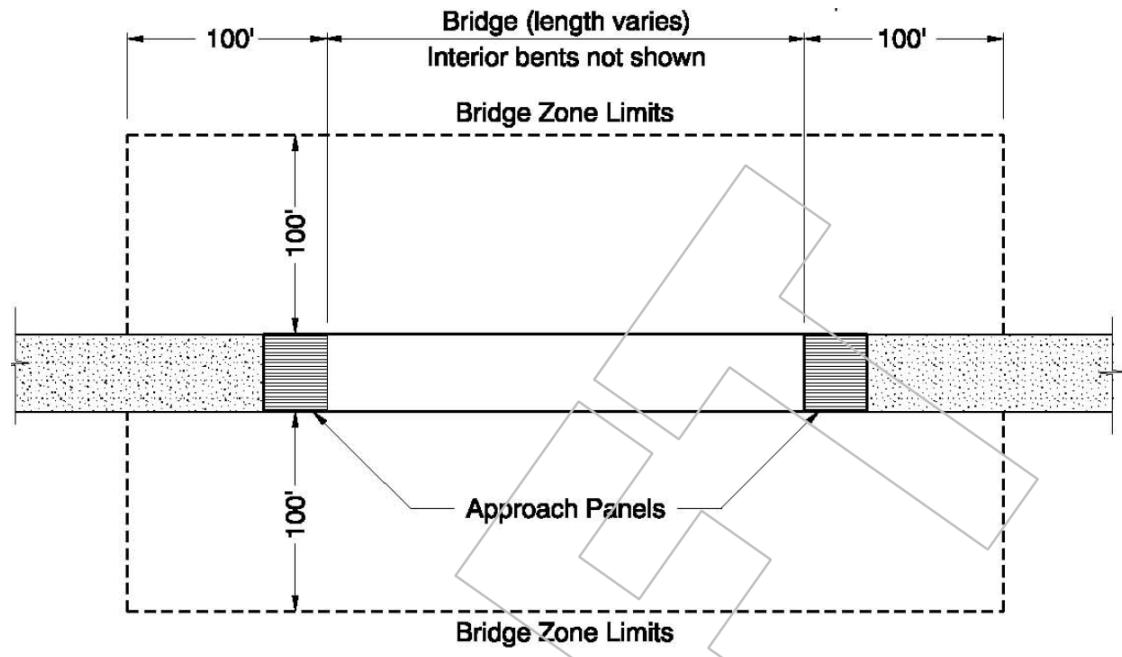
*Culvert Headwall (C\_Head)*

**Bridge Abutment**

The structural element at each end of a bridge, installed to support the end of the bridge span and to retain fill material on which the roadway rests immediately adjacent to the bridge. This category also includes wing walls that are monolithic with the abutment; except for wall portions that extend outside of the Bridge Zone limits (see diagram below).

### Bridge Zone Retaining Wall

Retaining wall within the *Bridge Zone* (see diagram below) that does not meet the definition of a bridge abutment.



### Highway Retaining Wall

Wall that is:

- not inside a *bridge zone*,
- and does not meet the definitions for *minor retaining wall* or *culvert headwall*.
- **≥4 ft total height (exposed height plus embedment depth) at any point along wall.**

### Minor Retaining Wall

Wall that is:

- not inside a *bridge zone*,
- does not meet definition for a *culvert headwall*
- **less than 4 ft in total height (at point of maximum height along wall).**

### Culvert Headwall

Culvert headwalls located outside of bridge zone and  $\geq 6$  ft total height (exposed height plus embedment).

Note that for headwalls with attached wing walls, the three individual component walls would be identified in the inventory as one wall.

### **Wall Function/Application (IWFuncT)**

Assign according to the primary purpose for the wall.

Remember, the subject structure must meet the general criteria first. Seawalls and flood control walls – for instance – that are not associated with a roadway would not qualify.

- Bridge associated (Br\_Assoc)*
- Slope stabilization (S\_Prot)*
- Grade separation (Gr\_Sep)*
- Roadway widening (Rd\_wide)*
- Roadway cut (Rd\_cut)*
- Access ramp (A\_ramp)*
- Flood control (F\_Control)*
- Pedestrian undercrossing (Ped\_Und\_St)*
- Seawall/Bulkhead (S\_Wall)*
- Other*

### **Wall Type (*IWTypeT*)**

A wall classification based on structural type or construction materials used in the wall. The wall types listed in this field correspond directly to those used by the FHWA, Central Lands Highway Division in their *National Park Service Retaining Wall Inventory* (2010).

Choices for WALL TYPE in the selection menu are specific versions of the broader, generic wall type **groups** defined below (Brutus and Tauber, 2009).

anchored wall	Wall that is provided with additional support by tiebacks (ground anchors) to a grouted zone or deadman anchors.
bin wall	A gravity retaining structure made up of interlocking metal or concrete bins. These are filled with granular, free-draining soil compacted in each unit.
cantilever wall	Wall that resists the lateral pressure of the retained soil partly or entirely by the use of countervailing soil forces. Cantilever walls may be straight (embedded) or may be shaped like an L or an inverted T.
crib wall	A gravity retaining structure made of interlocking timber or concrete elements stacked log-cabin style to form a series of gridwork compartments or cribs, which are filled with granular material or stone.
gravity wall	Retaining wall that is prevented from overturning or sliding by its own dead weight.
mechanically stabilized earth (MSE) wall	Wall systems that employ either metal (strips, grid, wire mesh) or polymer (strip, grid, sheet) reinforcements in the backfill soil to stabilize it. The reinforcement is connected to a vertical or near-vertical wall facing.
pile wall	Wall consisting of a row of piles.
soil nail wall	System in which in situ soil is reinforced by the insertion of steel reinforcing bars which are drilled and grouted. The bars are relatively closely spaced (3 to 6 ft) and are anchored at the wall face, which may consist of shotcrete or precast facing panels.

Listed below are the TYPE options that are used in the RWI, along with the naming structure for entering the information into the ArcGIS layer. Example: You determine you have a cantilever wall by using the as built and the table above. The wall is shown to be made of concrete. You find from the list below that the Wall Type is a “Cantilever Concrete Wall.” In ArcGIS under the field IWTypeT you would enter Cant\_Conc for this wall.

Example photographs are shown in Appendix B.

Wall Type	IWTypeT
Tieback H-Pile	T_HPile
MicroPile	MicroPile
Tieback Sheet Pile	T_SPile
Bin, Metal	Metal
Bin, Concrete	Concrete
Cantilever, Concrete	Cant_Conc
Cantilever, Soldier Pile	S_Pile
Cantilever, Sheet Pile	Sh_Pile
Crib, Concrete	Cr_C
Crib, Metal	Cr_M
Crib, Timber	Cr_T
Gravity, Concrete Block/Brick	Gr_C
Gravity, Mass Concrete	Gr_MC
Gravity, Dry Stone	Gr_DS
Gravity, Gabion	Gr_G
Gravity, Mortared Stone	Gr_MS
MSE, Geosynthetic Wrapped Face	MSE_G
MSE, Precast Panel	MSE_PP
MSE, Segmental Block	MSE_SB
MSE, Welded Wire Face	MSE_WWF
Soil Nail	SN
Tangent/Secant Pile	TS
Other, User Defined	Other

Refer to the 1999 FHWA publication *Geotechnical Engineering Circular No. 2: Earth Retaining Systems* for additional descriptions of wall types used in highway projects. The

more recent publication *Earth Retaining Structures* (FHWA-NHI-132036) serves as a newer reference manual on the topic.

AK DOT& PF has issued standard drawings for cantilever retaining walls (B-04.00 and B-05.00), bin walls (B-08.00), and headwalls (D-30.01), available in the *Alaska Standard Drawings Manual*.

## **WALL DIMENSION DATA**

### ***Maximum Exposed Height (ft) (MMExpWHN)***

Along the length of a wall, the greatest vertical distance measured from the finish grade at the bottom of the wall to the top of the wall.

This height does not include any embedded portion of the wall, and does not include attachments (e.g., parapet).

### ***Maximum Total Height (ft) (MMHeigtN)***

Along the length of a wall, the greatest vertical distance measured from the base of the wall structure to the top of the wall.

This height combines the exposed height of the wall along with the embedment depth, and does not include attachments (e.g., parapet).

### ***Length (ft) (MWLengtN)***

The total length of the structure.

### ***COMMENTS (IComntsT)***

Input any additional information or comments that may prove helpful in resolution of apparently contradictory or incomplete data.

### ***E-DOCS HYPERLINK (IHypLnkT)***

Provide URL for source document accessed in Alaska DOT&PF *eDOCS* system (also known as EDMS, *Electronic Document Management System*) system.

<http://web.dot.state.ak.us/eDocs/index.html>

## **ATTACHMENTS**

Attachments are primarily contained in AGOL and should be used for photos of rated retaining walls.

## REFERENCES

- Brutus, O., Tauber, G., 2009, *Guide to Asset Management of Earth Retaining Structures*, National Cooperative Highway Research Program.
- Oregon Department of Transportation, 2012, *Geotechnical Design Manual*, Oregon Department of Transportation, Technical Services Branch, Geo-Environmental Section.
- Sabatini, P.J., Elias, V., Schmertmann, G.R., Bonaparte, R., 1997, *Earth Retaining Systems*, Geotechnical Engineering Circular No. 2 FHWA.
- DeMarco, M., Keough, D., Lewis, S., 2010, *National Park Service Retaining Wall and Condition Assessment Program (WIP)*, *National Park Service Procedures Manual*, Federal Highway Administration, Central Federal Lands Highway Division.
- Beckstrand, D.L., Mines, A.E., Thompson, P.D., Pierson, L.A., Kimmerling, R.E., Benko, B.A., 2016 [draft], *Statewide Geotechnical Asset Management Program Development – Final Report for Rock Slopes, Unstable Soil Slopes and Embankments, Retaining Walls, Material Sites*, State of Alaska, Department of Transportation and Public Facilities, Research and Technology Transfer.

## APPENDIX A

TABLE 1 – AKDOT&PF Retaining Wall Inventory (RWI)  
Data Field Summary

TABLE 1 - DATA FIELDS FOR AKDOT/PF RETAINING WALL INVENTORY

	DATA FIELD	INPUT INTO ARCGIS	EXAMPLE	DATA FIELD DICTIONARY	REMARKS
GENERAL	Preliminary Inventory Record ID (OBJECTID)	Auto-Generated Object ID	206	Wall ID no.	[auto-tagged] OID assigned by ArcGIS in database serves as the prelim ID no. A final, formal ID for each wall will be assigned later.
	Log Entry By (ICreateT)	dot\username	dot\djprado	Name of person entering the record.	Enter in the name of the organization and or username into ArcGIS. Example for a dot user: dot\username. Example for a contractor : Use your AGOL account name (example: LandslideTechnology)
	Log Entry Date (IDateT)	Creation Date	6/26/2014	Date of original data input.	If entering a brand new entry, enter in the current date. However, if you are editing a current entry do not change the information.
	Log Edit by (IEditT)	dot\username	dot\miskra	Name of person editing the record.	Enter in the name of the organization and or username into ArcGIS. Example for a dot user: dot\username. Example for a contractor : Use your AGOL account name (example: LandslideTechnology)
	Log Revision Date (IDEditT)	Current Date	6/19/2015	Date of data revision	
	Data Source (IDataSrcT)	Enter in what source you are using to add a new retaining wall to the RWI	As Built	Source(s) of information used for this collection of wall data.	Examples include: As Built, Contractor Name, Google Earth, etc. As Built are the preferred method
	State Project No. (IAKSASNN)	AKSAS number	55264	AKSAS no.	
	Federal Project No. (IFedPrjtT)	Federal Project Number	IM-BR-OA1-5(19)	Fed proj no.	
	Construction As-Built Date (IConstDN)	Enter As-Built Date	9/18/2002	Date of final as-built drawing.	Use date for existing wall. For existing wall (supersedes the original construction project number in cases of replacement or rehabilitation).
	AKDOT&PF Region (IRegionT)	Northern/Central/Southcoast	Central	Region in which wall is located.	Specify region in which wall is located.
LOCATION	Route Name (CDS) (IHwyNamT)	CDS Route Name from TGIS	Glenn Highway	Official route name in Coordinated Data System	As defined by AK DOT&PF Transportation Information Group. Applicable routes include those owned and/or maintained by AKDOT&PF.
	Route Number (CDS) (ICDSRtNN)	CDS Route Number from TGIS	135000	Official route number in Coordinated Data System .	As defined by AK DOT&PF Transportation Information Group. Not physical milepost marker.
	Route Milepoint (CDS) (ICDSMPN)	CDS Milepoint number	98.99	Milepoint location on the route.	Milepoint is created from the TGIS CDS layer by using identify route location in linear referencing.
	Route Milepost (IHwyMPN)	Route Milepost from TGIS Layer		Milepost location on the route	Milepost is created from the Milepost TGIS layer using the Mandli Lidar Extract (approximate to nearest tenth mile)
	Offset (ft) (IOffsetT)	distance ft	25	Offset distance from route centerline.	
	Offset (Left or Right) (IOsetLRN)	L/R	R	Offset from route centerline.	
	Wall Category [AK DOT&PF] (IWCatgrT)			Categorization based on responsibility assignments (design, management, and maintenance).	
	Bridge Abutment (Br_Abt)				See Procedures Manual
	Bridge Zone Retaining Wall (Br_Ret)			Within Bridge Zone. Walls that do not qualify as abutments.	Also includes wing walls that are monolithic with abutment.
	Highway Retaining Wall (H_Ret)			Wall located outside of Bridge Zone, and ≥ 4 ft tall (exposed ht).	
WALL CLASSIFICATION	Minor Retaining Wall (M_Ret)			Wall located outside of Bridge Zone, and is ≤ 4 ft tall (exposed ht).	
	Culvert Headwall (C_Head)			Culvert headwalls located outside of Bridge Zone and ≥6 ft.	
	Wall Function/Application (IWFuncT)			Primary purpose of the wall.	
	Bridge associated (Br_Assoc)				
	Grade separation (Gr_Sep)				
	Slope stabilization (S_Prot)		S_Prot		
	Roadway widening (Rd_wide)				
	Roadway cut (Rd_cut)				
	Access ramp (A_Ramp)				
	Flood control (F_Control)				
WALL TYPE	Seawall/Bulkhead (S_Wall)				
	Other				
	Wall Type (IWTypeT)	Anchor, Tieback H-Pile (T_Hpile)			Such as tunnel face, storage bunker....
	Micropile (Micropile)				For general wall type descriptions, refer to Geotechnical Eng Circ No. 2 – Earth Retaining Systems (FHWA-SA-96-038)
	Tieback Sheet Pile (T_Spile)				
	Bin, Metal (Metal)				For descriptions and photo examples for the wall type menu items, refer to pages 53-69 in Procedures Manual – National Park Service Retaining Wall Inventory and Condition Assessment Program (WIP)[FHWA publication no. FHWA-CFL/TD-10-003]
	Bin, Concrete (Concrete)				
	Cantilever, Concrete (Cant_Conc)				
	Cantilever, Soldier Pile (S_Pile)				AK DOT& PF has issued standard drawings for cantilever retaining walls (B-04.00 and B-05.00) and bin walls (B-08.00), available in the Alaska Standard Drawings Manual .
	Cantilever, Sheet Pile (Sh_Pile)				
	Crib, Concrete (Cr_C)				
	Crib, Metal (Cr_M)				
	Crib, Timber (Cr_T)				
	Gravity, Concrete Block/Brick (Gr_C)				
	Gravity, Mass Concrete (Gr_MC)				
	Gravity, Dry Stone (Gr_DS)				
	Gravity, Gabion (Gr_G)				
	Gravity, Mortared Stone (Gr_MS)				
	MSE, Geosynthetic Wrapped Face (MSE_G)				
	MSE, Precast Panel (MSE_PP)				
	MSE, Segmental Block (MSE_SB)				
	MSE, Welded Wire Face (MSE_WWF)				
	Soil Nail (SN)				
	Tangent/Secant Pile (TS)				
	Other, User Defined (Other)				
WALL DIMENSIONS	Max. Exposed Height (ft) (MMExpWHN)	-	23	The greatest vertical distance measured from the finish grade at the bottom of the wall to the top of the wall.	This height does not include any embedded portion of the wall, and does not include attachments (e.g., parapet).
	Max. Total Height (ft) (MMHeightN)	-	30	The greatest vertical distance measured from the base of the wall structure to the top of the wall.	This height combines the exposed height of the wall along with the embedment depth, and does not include attachments (e.g., parapet)
	Length (ft) (MWLengthN)	-	1690	Total length of the structure.	
COMMENTS (IComntsT)			wall III from As-Built	Additional information.	
EDOCs HYPERLINK (IHypLnkT)	edoc link	edoc link	http://ancedocs-ucm.dot.state.ak.us/anc-dot-edocs/groups/design_public/documents/reports/dot-anc_089224.pdf	Link for the source document: As-Built, Report, etc.	Data source link, attached reports, photos.

## APPENDIX B

### Photographs: Wall Type Examples

Bin-Metal



MSE-Segmental Block



MSE-Precast Panel



MSE-Wire Welded Face



Gravity-Gabion



Cantilever-Concrete



Gravity-Dry Stone



Crib-Concrete



Gravity-Concrete Block



Cantilever-Soldier Pile



Tiered wall

