Environmental Assessment for the Proposed HIO 13R-31L RSA Improvements

Draft EA

Hillsboro Airport (HIO), Hillsboro, Oregon | April 2021

Appendix B: Modification of Airport Design Standards (MOS) for Hillsboro Airport, March 2016

For further information:

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT:	2. LOCATION(CITY,STATE):	3. LOC ID:
Hillsboro Airport	Hillsboro, Oregon	HIO

4. EFFECTED RUNWAY/TAXIWAY:	5. APPROACH (EACH RUNWAY):13R	6. AIRPORT REF. CODE (ARC):
13R-31L	☒ PIR ☐ NPI ☐ VISUAL	C-III

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): GULFSTREAM IV

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):
Federal Aviation Administration, Advisory Circular 150/5300-13A Change 1 – Chapter 3. Runway Design – Paragraph 313.b.(2) Surface gradient for Aircraft approach categories C, D, and E

9. STANDARD/REQUIREMENT:
AC 150/5300-13A Change 1, Paragraph 313.b.2 states, the maximum allowable grade change for a runway centerline is +/- 1.50 percent; however, no grade changes are allowed in the first and last quarter, or first and last 2,500 feet, whichever is less, of the runway length.

For HIO Runway 13R/31L, the total runway length is 6,600 feet, which equates to no centerline grade changes in the first and last 1,650 feet of the runway length.

10. PROPOSED:
Modification proposes to allow an existing 200 foot vertical curve, starting at 415 feet from the end of Runway 13R, to remain in place within the last quarter length of Runway 13R-31L, as part of the runway keel section rehabilitation for a limited period of time. The vertical curve would be corrected as part of the HIO Runway Safety Area (RSA) project planned for 2021.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):
The keel section of the Runway 13R/31L pavement is at the end of its useful life and requires rehabilitation and/or reconstruction to safely continue operations. The runway project scheduled to start in 2018 includes proposed rehabilitation of the runway keel section in order to adequately address the existing condition of the pavement, but minimize operational impacts associated with work on the runway. The existing 13R end quarter length of runway contains a 200 foot vertical curve that joins tangent sections with a total grade change of 0.19%. This vertical curve is not permitted in this last quarter of the runway as noted in Section 10 of this Modification of Standard (MOS) document. The tangent sections are -0.075% and -0.270%; no longitudinal grade in this last quarter exceeds the maximum allowed 0.8 percent. See the attached Runway 13R/31L Profile plan sheet that shows the existing centerline profile at the 13R end of the runway. This precision instrument runway end does have an Instrument Landing System (ILS) with a MALSR and a glide slope, with the glide slope antenna located 910 feet from the Runway 13R end. The Runway 13R ILS approach visibility minimum is ½ mile. See the attached Runway 13R/31L Plan sheet that

shows the airfield NAVAIDS and glide slope critical area at the 13R end of the runway. The keel rehabilitation approach requires the centerline profile to follow the existing runway grade in order to match the existing outer runway edge and shoulder grades. In order to maintain runway operations following each phase of construction, existing grades must be followed in order to accommodate tie-ins at phase lines of runway and taxiway connections. As discussed in Section 12 of this MOS document, the more extensive reconstruction required to achieve the runway longitudinal grade correction is better accomplished in the upcoming RSA project, currently scheduled for 2021, than in the runway rehabilitation project in the coming years, since scheduling the projects the way they are proposed will greatly minimize the total extent and cost of reconstruction required on the runway and the adjacent connector taxiways. The proposed runway centerline profiles for the RSA project and the full width runway reconstruction project are shown on the attached Profile plan sheet. Given the regrading needed in the RSA off the runway end, the schedule identified in Section 12 as the preferred alternative is the most logical way to sequence the regrading of the runway in order to get the longitudinal grade to meet standards.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The existing vertical curve will remain within the end quarter of Runway 13R as an interim condition until the future Runway Safety Area (RSA) project. The RSA project will require an extensive amount of grading, part of which would correct the existing runway vertical curve. The general scope of the RSA project related to the vertical curve correction would include: runway, taxiway, and blast pad paving, site grading and drainage improvements, lighting and signage improvements, pavement marking, and NAVAID modifications (MALSR/ILS) within approximately the end 415 feet of Runway 13R. Addressing the vertical curve issue right now would require full depth, full width reconstruction of 1,400 feet of runway (approximate cost of $6.7M) in order to match into existing grades instead of only 415 feet of full depth reconstruction/pavement overlay (approximate cost of $1.1M) in order to match into the grading that is anticipated with the RSA project.

The following schedule is proposed for the resolution of the existing vertical curve issue:

- Runway Phase 1 - 2018
- Runway Phase 2 - 2019
- Runway Phase 3 - 2020
- Runway Phase 4 - 2022
- Master Plan: 2016-2018
- RSA Environmental Assessment: 2019-2021
- RSA Project: 2021-2023

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

Runway 13R/31L is currently operating safely under existing runway grade conditions. No issues related to the existing runway longitudinal grade have been evident. However, the existing runway pavement is at the end of its useful life and requires immediate rehabilitation and/or reconstruction to continue to maintain safe operations. A keel section rehabilitation addresses the pavement that requires immediate attention. We expect that, based on our past safety record on this runway and current usage, maintaining current grade conditions in conjunction with the runway rehabilitation project will provide an acceptable level of safety until the vertical curve correction is completed as part of the future RSA project. The preferred option outlined in Section 12 of this MOS document provides the best economy as it allows preservation of the existing pavements now while sequencing the needed

redevelopment of the runway longitudinal grade in a way that minimizes overall pavement reconstruction and adjacent regrading.

ATTACH ADDITIONAL SHEETS AS NECESSARY – INCLUDE SKETCH/PLAN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION: 1	LOCATION: HIO	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION: Port of Portland	16 TELEPHONE: 503-415-6395
17. DATE OF LATEST FAA SIGNED ALP: April, 2012		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20 DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR
ACE-220	[signature]	03/03/2016	Concur	

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

redevelopment of the runway longitudinal grade in a way that minimizes overall pavement reconstruction and adjacent regrading.

ATTACH ADDITIONAL SHEETS AS NECESSARY – INCLUDE SKETCH/PLAN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

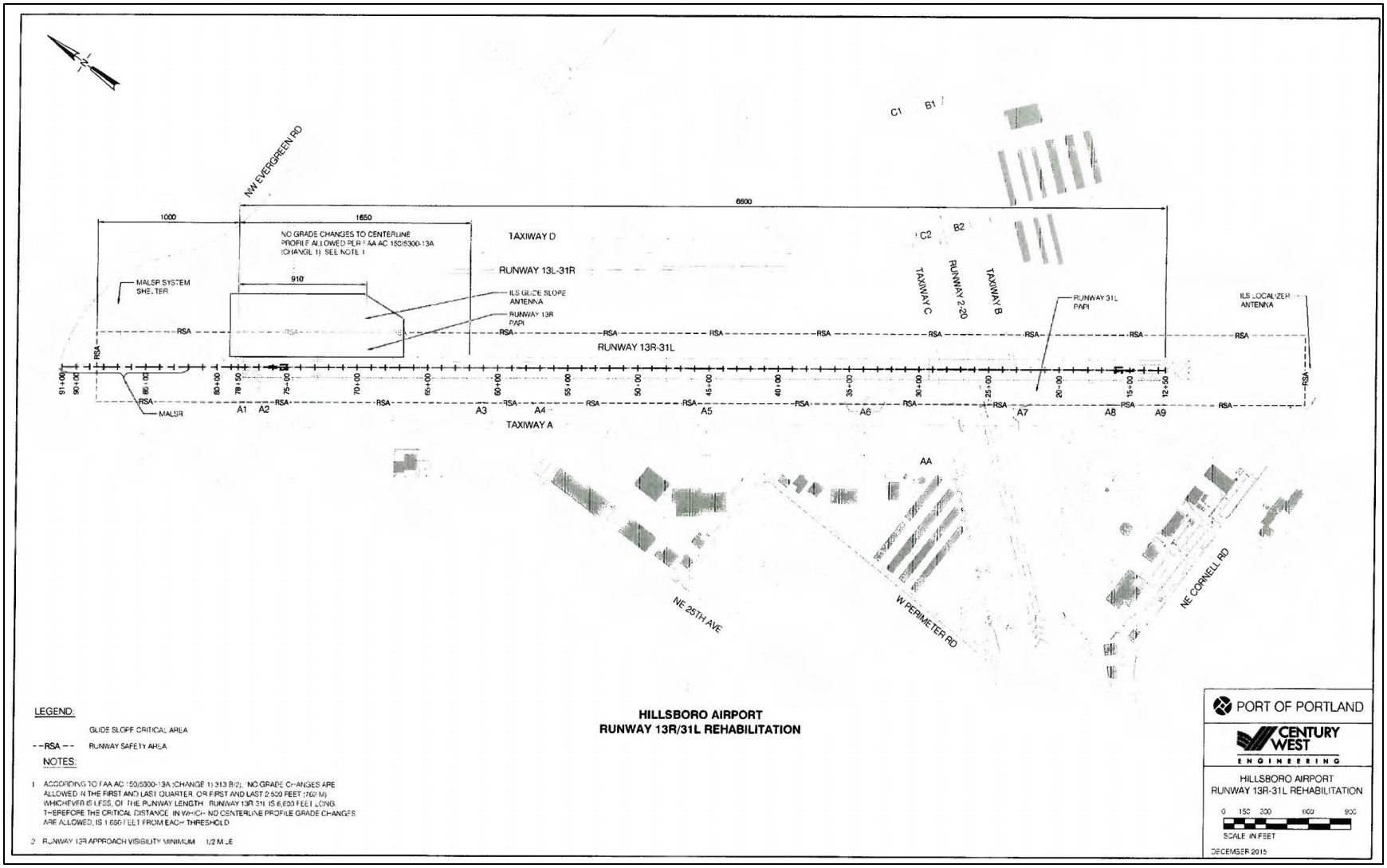
MODIFICATION: 1	LOCATION: HIO	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR: 1/28/16	15. ORIGINATOR'S ORGANIZATION: Port of Portland	16. TELEPHONE: 503-415-6395
17. DATE OF LATEST FAA SIGNED ALP: April, 2012		
18. ADO RECOMMENDATION: Conditional Approval	19. SIGNATURE: Julie Briggs	20. DATE: 2/2/16
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

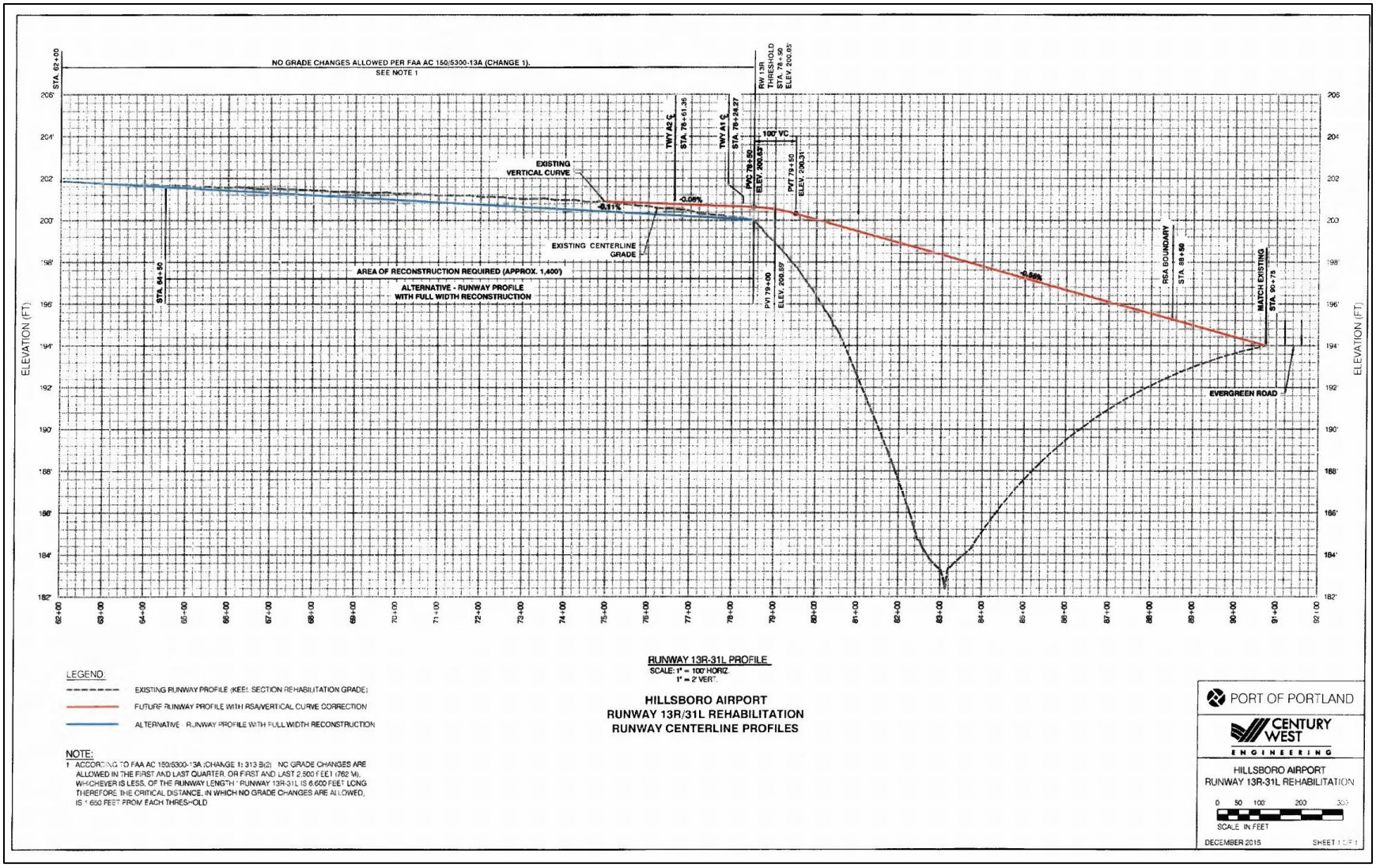
ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR
ANM-622		3/3/2016	X	
ACE-220 See attached				

COMMENTS:
Conditional approval by The Region acceptable per Khalil Kadsi 3/3/2016
The airport agrees to take corrective actions as stated within Box 12 of this MOS.

22. AIRPORTS' DIVISION FINAL ACTION:
ANM-622 3/3/2016

☐ UNCONDITIONAL APPROVAL	☒ CONDITIONAL APPROVAL	☐ DISAPPROVAL


NW EVERGREEN RD
1000
1650
6600
NO GRADE CHANGES TO CENTERLINE PROFILE ALLOWED PER FAA AC 150/5300-13A (CHANGE 1) SEE NOTE 1
910
TAXIWAY D
RUNWAY 13L-31R
MALSR SYSTEM SHELTER
ILS GLIDE SLOPE ANTENNA
RUNWAY 13R PAPI
RUNWAY 13R-31L
TAXIWAY C
RUNWAY 2-20
TAXIWAY B
RUNWAY 31L PAPI
ILS LOCALIZER ANTENNA
RSA
MALSR
A1
A2
A3
A4
A5
A6
A7
A8
A9
TAXIWAY A
AA
NE 25TH AVE
W PERIMETER RD
NE CORNELL RD
LEGEND:
GLIDE SLOPE CRITICAL AREA
RUNWAY SAFETY AREA
NOTES:
1 ACCORDING TO FAA AC 150/5300-13A (CHANGE 1) 313 B(2), NO GRADE CHANGES ARE ALLOWED IN THE FIRST AND LAST QUARTER, OR FIRST AND LAST 2,500 FEET (762 M) WHICHEVER IS LESS, OF THE RUNWAY LENGTH. RUNWAY 13R-31L IS 6,650 FEET LONG. THEREFORE THE CRITICAL DISTANCE IN WHICH NO CENTERLINE PROFILE GRADE CHANGES ARE ALLOWED, IS 1,650 FEET FROM EACH THRESHOLD.
2 RUNWAY 13R APPROACH VISIBILITY MINIMUM 1/2 MILE
HILLSBORO AIRPORT
RUNWAY 13R/31L REHABILITATION
PORT OF PORTLAND
CENTURY WEST ENGINEERING
HILLSBORO AIRPORT
RUNWAY 13R-31L REHABILITATION
0 150 300 600 900
SCALE IN FEET
DECEMBER 2015


NO GRADE CHANGES ALLOWED PER FAA AC 150/5300-13A (CHANGE 1).
SEE NOTE 1
STA. 62+00
RW 13R THRESHOLD STA. 78+50 ELEV. 200.85'
TWY A2 ℄ STA. 78+61.36
TWY A1 ℄ STA. 79+24.27
100' VC
EXISTING VERTICAL CURVE
PVC 78+50 ELEV. 200.63'
PVT 79+50 ELEV. 200.31'
-0.11%
-0.06%
EXISTING CENTERLINE GRADE
AREA OF RECONSTRUCTION REQUIRED (APPROX. 1,400')
ALTERNATIVE - RUNWAY PROFILE WITH FULL WIDTH RECONSTRUCTION
STA. 64+50
PVT 79+00 ELEV. 200.89'
-0.58%
RSA BOUNDARY STA. 88+50
MATCH EXISTING STA. 90+75
EVERGREEN ROAD
ELEVATION (FT)
LEGEND:
EXISTING RUNWAY PROFILE (KEEL SECTION REHABILITATION GRADE)
FUTURE RUNWAY PROFILE WITH RSA/VERTICAL CURVE CORRECTION
ALTERNATIVE - RUNWAY PROFILE WITH FULL WIDTH RECONSTRUCTION
NOTE:
1. ACCORDING TO FAA AC 150/5300-13A (CHANGE 1) 313 B(2) NO GRADE CHANGES ARE ALLOWED IN THE FIRST AND LAST QUARTER, OR FIRST AND LAST 2,500 FEET (762 M), WHICHEVER IS LESS, OF THE RUNWAY LENGTH. RUNWAY 13R-31L IS 6,600 FEET LONG. THEREFORE, THE CRITICAL DISTANCE, IN WHICH NO GRADE CHANGES ARE ALLOWED, IS 1,650 FEET FROM EACH THRESHOLD.
RUNWAY 13R-31L PROFILE
SCALE: 1" = 100' HORIZ.
1" = 2' VERT.
HILLSBORO AIRPORT
RUNWAY 13R/31L REHABILITATION
RUNWAY CENTERLINE PROFILES
PORT OF PORTLAND
CENTURY WEST ENGINEERING
HILLSBORO AIRPORT
RUNWAY 13R-31L REHABILITATION
0 50 100 200
SCALE IN FEET
DECEMBER 2015

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