

APPENDIX A

DESIGN DOCUMENTATION

MEMORANDUM

TO: Tom Cobb, P.E. **DATE:** December 11, 2008
FROM: Roger Mieden, CFM **PROJ #:** FCB0249
SUBJECT: Floodplain Issues Related to
Cheyenne Greenway Underpass
Options

Introduction:

Construction of a proposed pedestrian underpass under East Lincolnway lies within a designated 100-year City of Cheyenne Special Flood Hazard Area as shown on the March 2007 "City of Cheyenne Special Flood Hazard Areas and depending on design details or the option selected may also lie in Zone A on the effective FEMA FIRM for the area (Map Number 56021C1093F, Effective Date January 17, 2007).

Comparison of Options:

Two options for alternative alignments for the pedestrian trail and underpass were developed.

With Option 1, a box culvert underpass is proposed with a proposed trail from the north side of the culvert extending east to a connection with an existing pedestrian path on the north side of East Lincolnway. With Option 1, the underpass and the most of the path lie in the designated 100-year City Floodplain, but not within the FEMA floodplain. The proposed box culvert is lower than the 100-year flood elevation and to avoid increasing the frequency of downstream flooding, it will be necessary to provide a wall along the path north of E. Lincolnway. Option 1 does not lie within or impact the FEMA floodplain, there would be fewer potential issues due to FEMA regulations. The greatest concern is that if the improvements are proposed in a FEMA floodplain, FEMA may consider the wall as a levee and the design would be subject to much more stringent design criteria and regulatory requirements. If considered as a levee, additional freeboard requirements of 3 to 4 feet would apply, additional evaluation of seepage and stability would be required and a formal maintenance plan would have to be prepared. Since Option 1 does not lie within a FEMA floodplain, the City of Cheyenne would not necessarily be obligated to follow FEMA levee requirements, although they may choose to do so as a matter of policy.

With Option 2, the trail extends northwest from the north side of the pedestrian underpass and connects to existing trails around Minnehaha Lake. With Option 2, a significant portion of the proposed trail lies in the designated FEMA 100-year floodplain and FEMA levee requirements would likely apply. This could potentially have a significant impact on the design due to

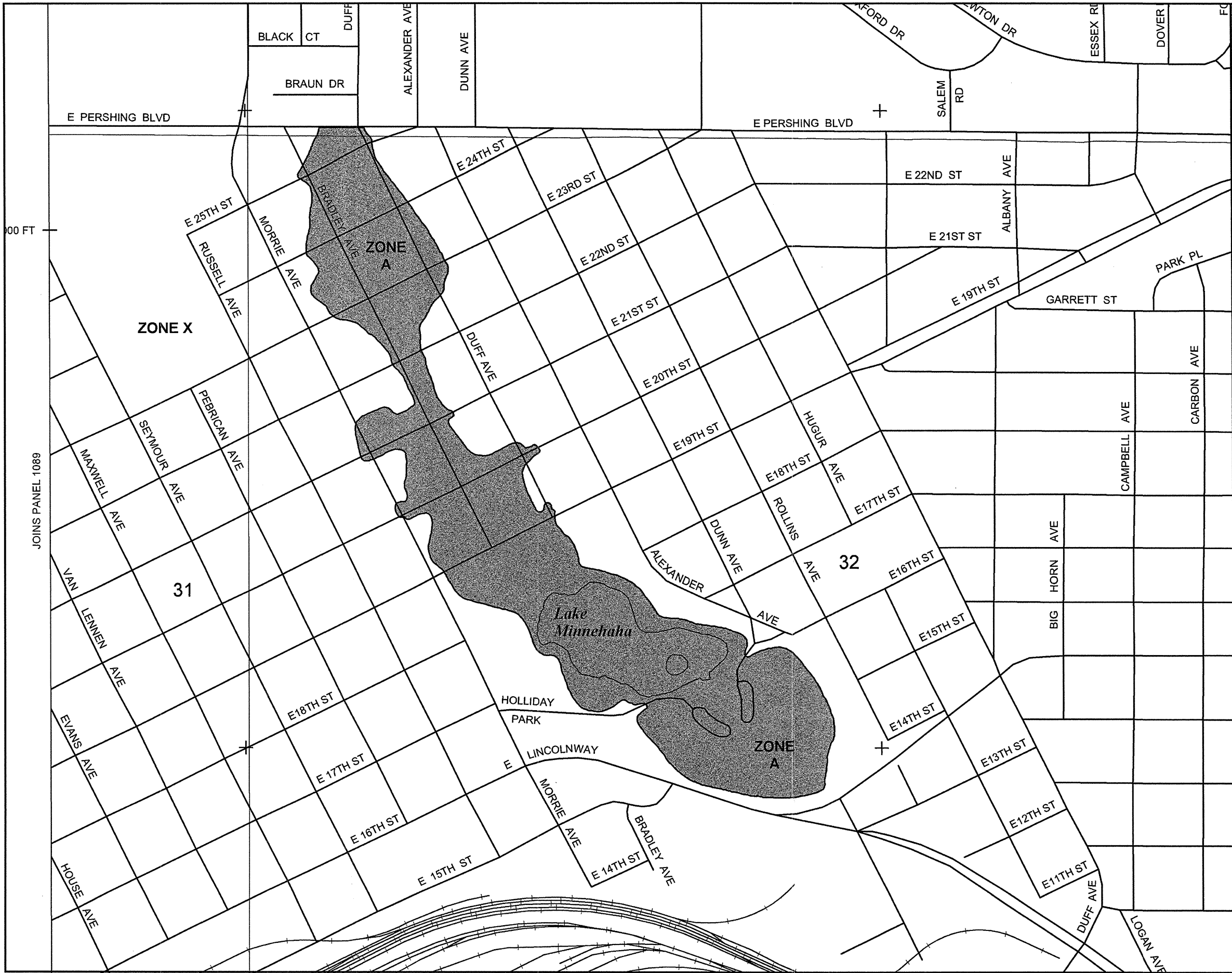
freeboard requirements and other issues noted above. Additional floodplain analysis and mapping would also be required if considered as a levee.

With Option 3, a pedestrian overpass is proposed, with footings that would be within the 100-year City Floodplain. Depending on design details, this should not have a significant effect on flood elevations for the 100-year City Floodplain and no effect on the FEMA floodplain.

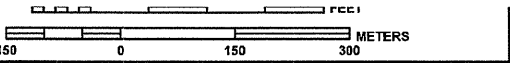
Conclusions:

From a floodplain permitting and design perspective, it would appear that Option 3 would be the most preferable option. Option 3 should have little or no effect on flood elevations and minimal regulatory issues. With both Option 1 and 2, the box culvert would be flooded during a severe storm and pose more risk to pedestrians during a flood than the Option 3/Overpass option.

If an underpass option is selected, Option 1 is clearly preferable to Option 2 since it would result in fewer potential impacts to flood elevations in the area and fewer regulatory issues than Option 2. In addition, with Option 1 it would be much easier to keep flow from the lake and overflow area from entering the box culvert.



ated in the Flood Insurance Study report for this jurisdiction.
insurance is available in this community, contact your insurance a
surance Program at 1-800-638-6620.





PANEL 1093F

FIRM
FLOOD INSURANCE RATE MAP
LARAMIE COUNTY,
WYOMING
AND INCORPORATED AREAS

PANEL 1093 OF 1650
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CHEYENNE, CITY OF	560030	1093	F
LARAMIE COUNTY	560029	1093	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
56021C1093F

EFFECTIVE DATE
JANUARY 17, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



insurance is available in this community, contact your insurance agent or the National Flood Insurance Program at 1-800-638-6620.

1929 → $\Delta = +3.291'$
1988

Aug = 3.30'

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = , PROGRAM = datasheet, VERSION = 7.67

1 National Geodetic Survey, Retrieval Date = APRIL 28, 2009

MO1087 *****

MO1087 DESIGNATION - LODGEPOLE

MO1087 PID - MO1087

MO1087 STATE/COUNTY- WY/LARAMIE

MO1087 USGS QUAD - CHEYENNE NORTH (1994)

MO1087

*CURRENT SURVEY CONTROL

MO1087

MO1087* NAD 83(1993)- 41 12 27.40201(N) 104 45 18.95789(W) ADJUSTED

MO1087* NAVD 88 - 1883. (meters) 6178. (feet) SCALED

MO1087

MO1087 LAPLACE CORR- -9.83 (seconds) DEFLEC99

MO1087 GEOID HEIGHT- -16.37 (meters) GEOID03

MO1087 HORZ ORDER - THIRD

MO1087

MO1087.The horizontal coordinates were established by classical geodetic methods
MO1087.and adjusted by the National Geodetic Survey in January 1997.

MO1087

MO1087.The orthometric height was scaled from a topographic map.

MO1087

MO1087.The Laplace correction was computed from DEFLEC99 derived deflections.

MO1087

MO1087.The geoid height was determined by GEOID03.

MO1087

MO1087; North East Units Scale Factor Converg.

MO1087;SPC WY E - 78,657.736 234,502.309 MT 0.99995215 +0 16 15.7

MO1087;SPC WY E - 258,062.92 769,362.99 sFT 0.99995215 +0 16 15.7

MO1087;UTM 13 - 4,561,833.211 520,517.786 MT 0.99960518 +0 09 40.4

MO1087

MO1087! Elev Factor x Scale Factor = Combined Factor

MO1087!SPC WY E - 0.99970729 x 0.99995215 = 0.99965946

MO1087!UTM 13 - 0.99970729 x 0.99960518 = 0.99931259

MO1087

MO1087: Primary Azimuth Mark

Grid Az

MO1087:SPC WY E - CAMEL 225 09 17.1

MO1087:UTM 13 - CAMEL 225 15 52.4

MO1087

PID	Reference Object	Distance	Geod. Az
MO1080	CAMEL	APPROX. 5.1 KM	2252532.8

MO1087

SUPERSEDED SURVEY CONTROL

MO1087

MO1087 NAD 83(1986)- 41 12 27.38659(N) 104 45 18.95612(W) AD() 3

MO1087 NAD 27 - 41 12 27.45896(N) 104 45 17.07564(W) AD() 3

MO1087

MO1087.Superseded values are not recommended for survey control.

MO1087.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

MO1087.See file dsdata.txt to determine how the superseded data were derived.

MO1087

MO1087 U.S. NATIONAL GRID SPATIAL ADDRESS: 13TEF2051861833(NAD 83)

MO1087 MARKER: DD = SURVEY DISK

MO1087 SETTING: 0 = UNSPECIFIED SETTING

MO1087 STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

MO1087

MO1087	HISTORY	- Date	Condition	Report By
MO1087	HISTORY	- 1910	MONUMENTED	USGS
MO1087	HISTORY	- 1960	GOOD	USGS

MO1087

STATION DESCRIPTION

MO1087

MO1087 DESCRIBED BY US GEOLOGICAL SURVEY 1910

MO1087 STATION IS ON DIVIDE BETWEEN LODGEPOLE CREEK AND CROW CREEK, ABOUT
MO1087 8.0 MI. NE. OF CHEYENNE AND IN THE SE. 1/4 OF SEC. 3, T 14 N, R 66 W.
MO1087 IT IS 1.8 MI. E. OF WHERE RD. FROM CHEYENNE TO WARRENS RANCH CROSSES
MO1087 THE DIVIDE ON FLAT RIDGE.

MO1087

MO1087 TO REACH FROM CHEYENNE POST OFFICE, GO N. ON U.S. HIGHWAYS 85 AND 87
MO1087 3.0 MI. TO GRAVEL RD. TO E., TURN RIGHT AND GO 1.0 MI. TO T-RD., TURN
MO1087 LEFT AND GO N. 1.1 MI. TO RD. INTERSECTION, TURN RIGHT AND GO 1.5 MI.
MO1087 TO CATTLEGUARD, TURN LEFT AND GO 0.7 MI. TO RANCH, CONTINUE N. 0.8 MI.
MO1087 TO POINT JUST S. OF SECOND RANCH, TURN RIGHT AND GO E. 0.5 MI., AT
MO1087 THIS POINT TURN S. AND GO ACROSS COUNTRY 0.1 MI. TO STATION.

MO1087

STATION RECOVERY (1960)

MO1087

MO1087 RECOVERY NOTE BY US GEOLOGICAL SURVEY 1960 (TW)

MO1087 STATION MARK--TABLET COUNTERSUNK IN TOP OF WHITE STONE, 30 X 8 X 8
MO1087 IN., SET IN GROUND, STAMPED ---LODGEPOLE 1910---

MO1087

MO1087 REFERENCE MARK NO. 1--STANDARD REFERENCE TABLET, STAMPED ---LODGEPOLE
MO1087 NO. 1 1947---, SET IN CONCRETE MONUMENT, 61.5 FT. SW. OF STATION.

MO1087

MO1087 REFERENCE MARK NO. 2--STANDARD REFERENCE TABLET, STAMPED ---LODGEPOLE
MO1087 NO. 2 1947---, SET IN CONCRETE MONUMENT, 65.2 FT. NW. OF STATION.

*** retrieval complete.

Elapsed Time = 00:00:00

1929 →
1988 $\Delta = + 3.264'$

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = , PROGRAM = datasheet, VERSION = 7.67

1 National Geodetic Survey, Retrieval Date = APRIL 28, 2009

MO1075 *****

MO1075 DESIGNATION - ARCHER

MO1075 PID - MO1075

MO1075 STATE/COUNTY- WY/LARAMIE

MO1075 USGS QUAD - ARCHER (1978)

MO1075

MO1075 *CURRENT SURVEY CONTROL

MO1075

MO1075* NAD 83(1993)- 41 09 33.67655(N) 104 39 44.13008(W) ADJUSTED

MO1075* NAVD 88 - 1840. (meters) 6037. (feet) SCALED

MO1075

MO1075 LAPLACE CORR- -8.16 (seconds) DEFLEC99

MO1075 GEOID HEIGHT- -16.84 (meters) GEOID03

MO1075 HORZ ORDER - SECOND

MO1075

MO1075.The horizontal coordinates were established by classical geodetic methods
MO1075.and adjusted by the National Geodetic Survey in January 1997.

MO1075

MO1075.The orthometric height was scaled from a topographic map.

MO1075

MO1075.The Laplace correction was computed from DEFLEC99 derived deflections.

MO1075

MO1075.The geoid height was determined by GEOID03.

MO1075

MO1075; North East Units Scale Factor Converg.

MO1075;SPC WY E - 73,339.804 242,333.538 MT 0.99995955 +0 19 55.1

MO1075;SPC WY E - 240,615.67 795,055.95 sFT 0.99995955 +0 19 55.1

MO1075;UTM 13 - 4,556,502.146 528,336.090 MT 0.99960988 +0 13 20.2

MO1075

MO1075! - Elev Factor x Scale Factor = Combined Factor

MO1075!SPC WY E - 0.99971411 x 0.99995955 = 0.99967367

MO1075!UTM 13 - 0.99971411 x 0.99960988 = 0.99932410

MO1075

MO1075|-----|

MO1075| PID Reference Object Distance Geod. Az |

MO1075| dddmmss.s |

MO1075| CP9510 ARCHER RM 1 10.882 METERS 09604 |

MO1075| CP9511 ARCHER RM 2 8.349 METERS 26103 |

MO1075| CP9509 ARCHER AZ MK 2730718.0 |

MO1075| MO1090 CHEYENNE VOR APPROX.10.9 KM 3014335.4 |

MO1075|-----|

MO1075

MO1075 SUPERSEDED SURVEY CONTROL

MO1075

MO1075 NAD 83(1986)- 41 09 33.66388(N) 104 39 44.12790(W) AD() 2

MO1075 NAD 27 - 41 09 33.73270(N) 104 39 42.25590(W) AD() 2

MO1075

MO1075.Superseded values are not recommended for survey control.

MO1075.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

MO1075.See file dsdata.txt to determine how the superseded data were derived.

MO1075

MO1075 U.S. NATIONAL GRID SPATIAL ADDRESS: 13TEF2833656502 (NAD 83)

MO1075 MARKER: DS = TRIANGULATION STATION DISK

MO1075 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

MO1075 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

MO1075+SATELLITE: SATELLITE OBSERVATIONS - May 06, 2005

MO1075

MO1075	HISTORY	- Date	Condition	Report By
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MO1075	HISTORY	- 1959	MONUMENTED	CGS
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MO1075	HISTORY	- 1973	GOOD	LOCENG
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MO1075	HISTORY	- 20050506	GOOD	WYGFD
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MO1075

MO1075 STATION DESCRIPTION

MO1075

MO1075 DESCRIBED BY COAST AND GEODETIC SURVEY 1959 (MJR)

MO1075 THE STATION IS LOCATED, AIRLINE, ABOUT 8 MILES EAST-NORTHEAST

MO1075 OF CHEYENNE, AT THE EAST END OF A U.S. HIGHWAY 30 OVERPASS,

MO1075 OVER THE UNION PACIFIC RAILROAD.

MO1075

MO1075 TO REACH THE STATION FROM THE UNION PACIFIC RAILROAD DEPOT

MO1075 IN CHEYENNE, GO NORTHWEST ON CAPITOL AVENUE FOR 1 BLOCK.

MO1075 TURN RIGHT ONTO U.S. HIGHWAY 30 (LINCOLN HIGHWAY) AND GO

MO1075 EASTERLY TOWARDS OMAHA FOR 7.25 MILES TO A SIDE ROAD, LEFT

MO1075 AND THE AZIMUTH MARK. CONTINUE EAST ON THE HIGHWAY FOR 0.6

MO1075 MILE TO THE EAST END OF THE OVERPASS AND THE STATION.

MO1075

MO1075 THE STATION IS A STANDARD DISK STAMPED ARCHER 1959 SET IN TOP

MO1075 OF A 10-INCH SQUARE CONCRETE MONUMENT WHICH PROJECTS 1 INCH

MO1075 ABOVE THE GROUND. IT IS 27 FEET EAST-NORTHEAST OF THE NORTHEAST

MO1075 CORNER OF THE OVERPASS, 23 FEET NORTH OF THE CENTER OF THE

MO1075 HIGHWAY AND 5 FEET NORTH OF THE GUARD RAIL.

MO1075

MO1075 REFERENCE MARK NUMBER ONE IS A STANDARD DISK STAMPED ARCHER

MO1075 NO 1 1959 SET IN TOP OF A 10-INCH SQUARE CONCRETE MONUMENT

MO1075 WHICH IS FLUSH WITH THE GROUND AND THE SAME ELEVATION AS

MO1075 THE STATION. IT IS 20 FEET NORTH OF THE CENTER OF THE HIGHWAY

MO1075 AND 2 FEET NORTH OF THE GUARD RAIL.

MO1075

MO1075 REFERENCE MARK NUMBER TWO IS A STANDARD DISK STAMPED ARCHER

MO1075 NO 2 1959 SET IN A DRILL HOLE IN THE NORTHEAST CORNER OF

MO1075 THE OVERPASS AND IS 1 FOOT HIGHER THAN THE STATION. IT IS

MO1075 20 FEET NORTH OF THE CENTER OF THE HIGHWAY.

MO1075

MO1075 THE AZIMUTH MARK IS A STANDARD DISK STAMPED ARCHER 1959 SET

MO1075 IN TOP OF A 10-INCH SQUARE CONCRETE MONUMENT WHICH PROJECTS

MO1075 4 INCHES ABOVE THE GROUND. IT IS 180 FEET NORTH-NORTHEAST OF

MO1075 THE CENTER OF THE JUNCTION OF THE SIDE ROAD AND U.S. HIGHWAY

MO1075 30, 41 FEET EAST OF THE CENTER OF THE GRAVELED SIDE ROAD,

MO1075 10 FEET EAST OF A FENCE CORNER AND 2 FEET EAST OF A METAL

MO1075 WITNESS SIGN.

MO1075

MO1075 HEIGHT OF LIGHT ABOVE STATION MARK 1.3 METERS.

MO1075

MO1075 STATION RECOVERY (1973)

MO1075

MO1075 RECOVERY NOTE BY LOCAL ENGINEER (INDIVIDUAL OR FIRM) 1973 (JW)

MO1075 RECOVERED BY--J.T. BANNER AND ASSOCIATES INC.

MO1075

MO1075 ARCHER-GOOD

MO1075

MO1075 GROUND LINE IS FLUSH WITH TOP OF MONUMENT.

MO1075'

MO1075'NO ATTEMPT MADE TO FIND REFERENCE MARKERS

MO1075

MO1075

STATION RECOVERY (2005)

MO1075

MO1075'RECOVERY NOTE BY WYOMING GAME AND FISH DEPARTMENT 2005 (RED)

MO1075'RECOVERED AS DESCRIBED

*** retrieval complete.

Elapsed Time = 00:00:00

1929 →
1988

$\Delta = + 3.340'$

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = , PROGRAM = datasheet, VERSION = 7.67

1 National Geodetic Survey, Retrieval Date = APRIL 28, 2009

MO1104 *****

MO1104 DESIGNATION - LUMMIS

MO1104 PID - MO1104

MO1104 STATE/COUNTY- WY/LARAMIE

MO1104 USGS QUAD - CHEYENNE SOUTH (1994)

MO1104

MO1104 *CURRENT SURVEY CONTROL

MO1104

MO1104* NAD 83(1993)- 41 05 36.93622(N) 104 45 10.90131(W) ADJUSTED

MO1104* NAVD 88 - 1884. (meters) 6181. (feet) SCALED

MO1104

MO1104 LAPLACE CORR- -9.30 (seconds) DEFLEC99

MO1104 GEOID HEIGHT- -16.56 (meters) GEOID03

MO1104 HORZ ORDER - THIRD

MO1104

MO1104.The horizontal coordinates were established by classical geodetic methods
MO1104.and adjusted by the National Geodetic Survey in January 1997.

MO1104

MO1104.The orthometric height was scaled from a topographic map.

MO1104

MO1104.The Laplace correction was computed from DEFLEC99 derived deflections.

MO1104

MO1104.The geoid height was determined by GEOID03.

MO1104

MO1104; North East Units Scale Factor Converg.

MO1104;SPC WY E - 65,996.866 234,750.148 MT 0.99995236 +0 16 18.8

MO1104;SPC WY E - 216,524.72 770,176.11 sFT 0.99995236 +0 16 18.8

MO1104;UTM 13 - 4,549,176.284 520,741.311 MT 0.99960529 +0 09 44.4

MO1104

MO1104! - Elev Factor x Scale Factor = Combined Factor

MO1104!SPC WY E - 0.99970716 x 0.99995236 = 0.99965953

MO1104!UTM 13 - 0.99970716 x 0.99960529 = 0.99931256

MO1104

MO1104: Primary Azimuth Mark

Grid Az

MO1104:SPC WY E - MERNA 195 46 43.5

MO1104:UTM 13 - MERNA 195 53 17.9

MO1104

MO1104|-----|

MO1104| PID Reference Object Distance Geod. Az |

MO1104| | dddmmss.s |

MO1104| MO1102 MERNA APPROX. 6.4 KM 1960302.3 |

MO1104| MO1082 CHEYENNE STATE CAPITOL DOME APPROX. 7.7 KM 3123529.9 |

MO1104|-----|

MO1104

MO1104 SUPERSEDED SURVEY CONTROL

MO1104

MO1104 NAD 83(1993)- 41 05 36.92122(N) 104 45 10.89899(W) AD() 3

MO1104 NAD 83(1986)- 41 05 36.92126(N) 104 45 10.89894(W) AD() 3

MO1104 NAD 27 - 41 05 36.98740(N) 104 45 09.01613(W) AD() 3

MO1104

MO1104.Superseded values are not recommended for survey control.

MO1104.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MO1104.See file dsdata.txt to determine how the superseded data were derived.

MO1104

MO1104 U.S. NATIONAL GRID SPATIAL ADDRESS: 13TEF2074149176(NAD 83)

MO1104 MARKER: DS = TRIANGULATION STATION DISK

MO1104 SETTING: 0 = UNSPECIFIED SETTING

MO1104 STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

MO1104

HISTORY	- Date	Condition	Report By
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HISTORY	- 1947	MONUMENTED	USGS
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MO1104

MO1104 STATION DESCRIPTION

MO1104

MO1104'DESCRIBED BY US GEOLOGICAL SURVEY 1947

MO1104'LUMMIS, LARAMIE CO., WYOMING, STATION IS ABOUT 3.5 MI. SE. OF

MO1104'CHEYENNE, IN SE. 1/4 OF SEC. 15, T 13 N, R 66 W.

MO1104'

MO1104'TO REACH FROM POST OFFICE IN CHEYENNE, GO S. 1.5 MI. ON U.S. HIGHWAYS

MO1104'85 AND 87 TO MACADAM ROAD ON LEFT, TURN LEFT AND GO 1.7 MI. TO TURN

MO1104'AT AIRPORT, TURN RIGHT AND GO 0.2 MI. TO RANCH, GO SE. THROUGH YARD

MO1104'AND CONTINUE 0.5 MI. TO WINDMILL, CONTINUE S. ALONG FENCE 0.2 MI. TO

MO1104'CORNER, GO 0.5 MI. NE. ACROSS COUNTRY TO OLD STOCK PENS, CONTINUE S.

MO1104'AND SLIGHTLY E. 0.8 MI. TO TOP OF RIDGE AND STATION.

MO1104'

MO1104'STATION MARK--STANDARD TABLET, SET IN A CONCRETE MONUMENT AND

MO1104'STAMPED ---LUMMIS 1947---

MO1104'

MO1104'REFERENCE MARK NO. 1--STANDARD REFERENCE TABLET, STAMPED ---LUMMIS

MO1104'NO. 1 1947---, SET IN CONCRETE MONUMENT, 57.0 FT. W. OF STATION.

MO1104'

MO1104'REFERENCE MARK NO. 2--STANDARD REFERENCE TABLET, STAMPED ---LUMMIS

MO1104'NO. 2 1947---, SET IN CONCRETE MONUMENT, 56.6 FT. N. OF STATION.

*** retrieval complete.

Elapsed Time = 00:00:00

1929 $\rightarrow$ $\Delta + 3.320'$
1988

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = , PROGRAM = datasheet, VERSION = 7.67

1 National Geodetic Survey, Retrieval Date = APRIL 28, 2009

MO1080 *****

MO1080 DESIGNATION - CAMEL

MO1080 PID - MO1080

MO1080 STATE/COUNTY- WY/LARAMIE

MO1080 USGS QUAD - CHEYENNE NORTH (1994)

MO1080

MO1080 *CURRENT SURVEY CONTROL

MO1080

MO1080* NAD 83(1993)- 41 10 30.75005(N) 104 47 55.61896(W) ADJUSTED

MO1080* NAVD 88 - 1907.3 (meters) 6258. (feet) VERTCON

MO1080

MO1080 LAPLACE CORR- -10.36 (seconds) DEFLEC99

MO1080 GEOID HEIGHT- -16.22 (meters) GEOID03

MO1080 HORZ ORDER - FIRST

MO1080

MO1080.The horizontal coordinates were established by classical geodetic methods

MO1080.and adjusted by the National Geodetic Survey in January 1997.

MO1080

MO1080.The NAVD 88 height was computed by applying the VERTCON shift value to
MO1080.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)

MO1080

MO1080.The Laplace correction was computed from DEFLEC99 derived deflections.

MO1080

MO1080.The geoid height was determined by GEOID03.

MO1080

MO1080; North East Units Scale Factor Converg.

MO1080;SPC WY E - 75,042.965 230,867.947 MT 0.99994922 +0 14 31.9

MO1080;SPC WY E - 246,203.46 757,439.26 sFT 0.99994922 +0 14 31.9

MO1080;UTM 13 - 4,558,226.659 516,877.767 MT 0.99960351 +0 07 56.9

MO1080

MO1080! - Elev Factor x Scale Factor = Combined Factor

MO1080!SPC WY E - 0.99970346 x 0.99994922 = 0.99965269

MO1080!UTM 13 - 0.99970346 x 0.99960351 = 0.99930709

MO1080

MO1080|-----|

MO1080| PID Reference Object Distance Geod. Az |

MO1080| dddmmss.s |

MO1080| CP8940 CAMEL RM 2 12.935 METERS 05634 |

MO1080| MO1084 CHEYENNE NORTH MUNICIPAL TANK 387.393 METERS 05949 |

MO1080| CP8941 CAMEL RM 3 14.395 METERS 08705 |

MO1080| MO1082 CHEYENNE STATE CAPITOL DOME APPROX. 4.3 KM 2045235.2 |

MO1080| MO1105 CHEYENNE SPEER MICROWAVE TOWER APPROX.16.1 KM 2090033.9 |

MO1080| MO1103 CHEYENNE RAD STA KVWO NEW MST APPROX. 6.9 KM 2101320.6 |

MO1080| MO1110 WARREN USAF BASE TANK APPROX. 7.7 KM 2383241.9 |

MO1080| MO1213 RADIO STATION KFBC MAST APPROX.19.4 KM 2443321.4 |

MO1080| MO1214 CHEYENNE MOUNTAIN BELL MAST APPROX.20.8 KM 2462337.8 |

MO1080| CP8939 CAMEL RM 1 15.175 METERS 28759 |

MO1080| MO1079 WARREN AFB MICROWAVE TOWER APPROX. 6.7 KM 3100833.6 |

MO1080|-----|

MO1080

MO1080 SUPERSEDED SURVEY CONTROL

MO1080
 MO1080 NAD 83(1986)- 41 10 30.73475(N) 104 47 55.61668(W) AD() 1
 MO1080 NAD 27 - 41 10 30.80570(N) 104 47 53.73160(W) AD() 1
 MO1080 NGVD 29 (07/19/86) 1906.3 (m) 6254. (f) VERT ANG 3
 MO1080
 MO1080.Superseded values are not recommended for survey control.
 MO1080.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 MO1080.See file dsdata.txt to determine how the superseded data were derived.
 MO1080
 MO1080 U.S. NATIONAL GRID SPATIAL ADDRESS: 13TEF1687858227(NAD 83)
 MO1080_MARKER: DS = TRIANGULATION STATION DISK
 MO1080_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 MO1080

MO1080	HISTORY	- Date	Condition	Report By
MO1080	HISTORY	- 1947	MONUMENTED	USGS
MO1080	HISTORY	- 1960	GOOD	USGS
MO1080	HISTORY	- 1960	GOOD	USGS
MO1080	HISTORY	- 1965	GOOD	CGS
MO1080	HISTORY	- 1973	GOOD	NGS

 MO1080
 MO1080
 MO1080 STATION DESCRIPTION
 MO1080
 MO1080'DESCRIBED BY US GEOLOGICAL SURVEY 1947
 MO1080'STATION IS ABOUT 2.5 MI. N. OF CHEYENNE, LOCATED IN S. 1/2 SEC. 17,
 MO1080'T 14 N, R 66 W. IT IS ON THE FIRST RANGE OF HILLS N. OF CHEYENNE.
 MO1080'
 MO1080'TO REACH FROM POST OFFICE IN CHEYENNE, GO N. ON U.S. HIGHWAYS 85 AND
 MO1080'87 2.4 MI. TO THE FIRST GRAVEL RD. N. OF THE AIRPORT, TURN RIGHT AND
 MO1080'GO 1.0 MI. TO A T-RD. INTERSECTION, CONTINUE STRAIGHT AHEAD THROUGH
 MO1080'WIRE GATE AND GO 1.0 MI. NE. TO STATION.
 MO1080
 MO1080 STATION RECOVERY (1960)
 MO1080
 MO1080'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1960 (CTH)
 MO1080'THE STATION IS LOCATED 3 MILES, AIRLINE, NORTHEAST OF DOWNTOWN
 MO1080'CHEYENNE NEAR THE SOUTHWEST END OF A LOW GRASSY RIDGE WHICH
 MO1080'RUNS IN A NORTHEAST-SOUTHWEST DIRECTION, IN THE SE CORNER OF THE
 MO1080'SW 1/4 OF SECTION 17, T. 14 N. R. 66 W.
 MO1080'
 MO1080'TO REACH THE STATION FROM THE STATE CAPITOL BUILDING IN
 MO1080'CHEYENNE GO NORTHERLY ON U.S. HIGHWAY 85 AND 87 FOR 1.5 MILES
 MO1080'TO A SIDE ROAD RIGHT. TURN RIGHT, NORTH AND GO 1 MILE TO A
 MO1080'CROSSROAD. TURN RIGHT, EAST AND GO 1 MILE TO ANOTHER CROSSROAD.
 MO1080'CONTINUE STRAIGHT AHEAD AND GO 0.5 MILE TO A WIRE GATE. PASS
 MO1080'THROUGH THE GATE AND GO NORTHEAST FOR 100 YARDS TO THE TOP
 MO1080'OF THE HILL AND THE STATION AS DESCRIBED.
 MO1080'
 MO1080'THE STATION MARK IS A U.S. GEOLOGICAL SURVEY STATION MARK
 MO1080'DISK SET IN THE TOP OF AN 8 INCH SQUARE CONCRETE MONUMENT,
 MO1080'WHICH PROJECTS 4 INCHES AND IS STAMPED CAMEL CAMEL 1947. IT
 MO1080'IS 47 FEET WEST OF A NORTH-SOUTH FENCE LINE.
 MO1080'
 MO1080'REFERENCE MARK NO. 1 IS A U.S. GEOLOGICAL SURVEY REFERENCE
 MO1080'MARK DISK SET IN THE TOP OF A 6 INCH SQUARE CONCRETE MONUMENT,
 MO1080'WHICH IS SET FLUSH AND IS STAMPED CAMEL NO 1.
 MO1080'
 MO1080'REFERENCE MARK NO. 2 IS A U.S. GEOLOGICAL SURVEY REFERENCE
 MO1080'MARK DISK SET IN THE TOP OF A 6 INCH SQUARE CONCRETE MONUMENT,
 MO1080'WHICH PROJECTS 4 INCHES AND IS STAMPED CAMEL NO 2. IT IS
 MO1080'8 FEET WEST OF A NORTH-SOUTH FENCE LINE AND IS 1 FOOT LOWER

4/28/2009

MO1080'6-INCH SQUARE PRECAST CONCRETE POST PROJECTING 6 INCHES ABOVE
MO1080'GROUND. IT IS 48 FEET WEST OF A METAL WITNESS POST WITH
MO1080'SIGN IN THE NORTH-SOUTH FENCE LINE.
MO1080'
MO1080'REFERENCE MARK NUMBER 1 IS A U.S. GEOLOGICAL SURVEY REFERENCE
MO1080'MARK DISK STAMPED CAMEL NO 1 CEMENTED IN THE TOP OF A 4-INCH
MO1080'PRECAST CONCRETE SQUARE POST PROJECTING 1 INCH ABOVE GROUND.
MO1080'IT IS 95.4 FEET WEST OF THE METAL WITNESS POST IN THE NORTH-SOUTH
MO1080'FENCE LINE AND AT THE SAME ELEVATION AS THE STATION.
MO1080'
MO1080'REFERENCE MARK NUMBER 3 IS A STANDARD DISK STAMPED CAMEL USGS
MO1080'NO 3 1973 1960 CEMENTED IN THE TOP OF A 12-INCH DIAMETER
MO1080'CYLINDRICAL CONCRETE MONUMENT PROJECTING 6 INCHES ABOVE GROUND.
MO1080'IT IS 2.8 FEET SOUTH OF THE METAL WITNESS POST IN THE NORTH-SOUTH
MO1080'FENCE LINE AND 0.8 FOOT WEST OF THE FENCE LINE.
MO1080'
MO1080'NO AZIMUTH MARK DISK WAS ESTABLISHED FOR THIS STATION.
MO1080'
MO1080'AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN--3 MILES
MO1080'NORTHEAST OF CHEYENNE.

*** retrieval complete.
Elapsed Time = 00:00:00

