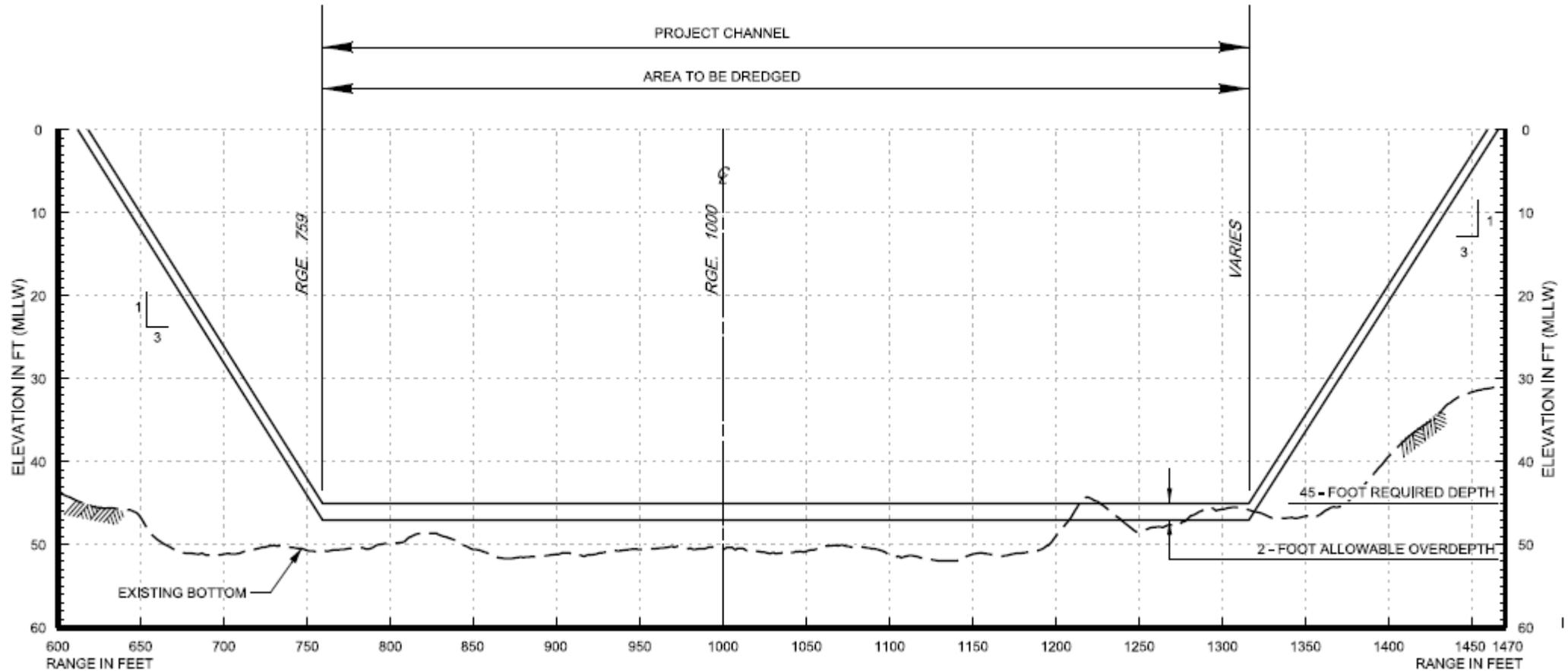


# Overdepth - A Lesson on Tolerance

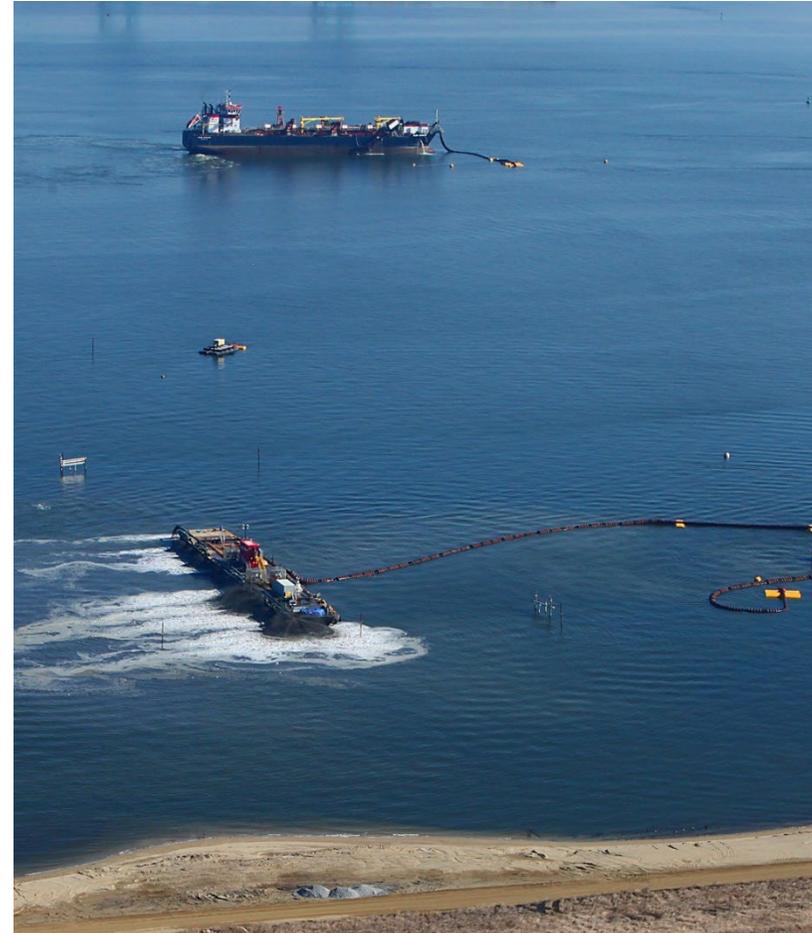
Presented By: Kyle Howell – Manson Construction Co.



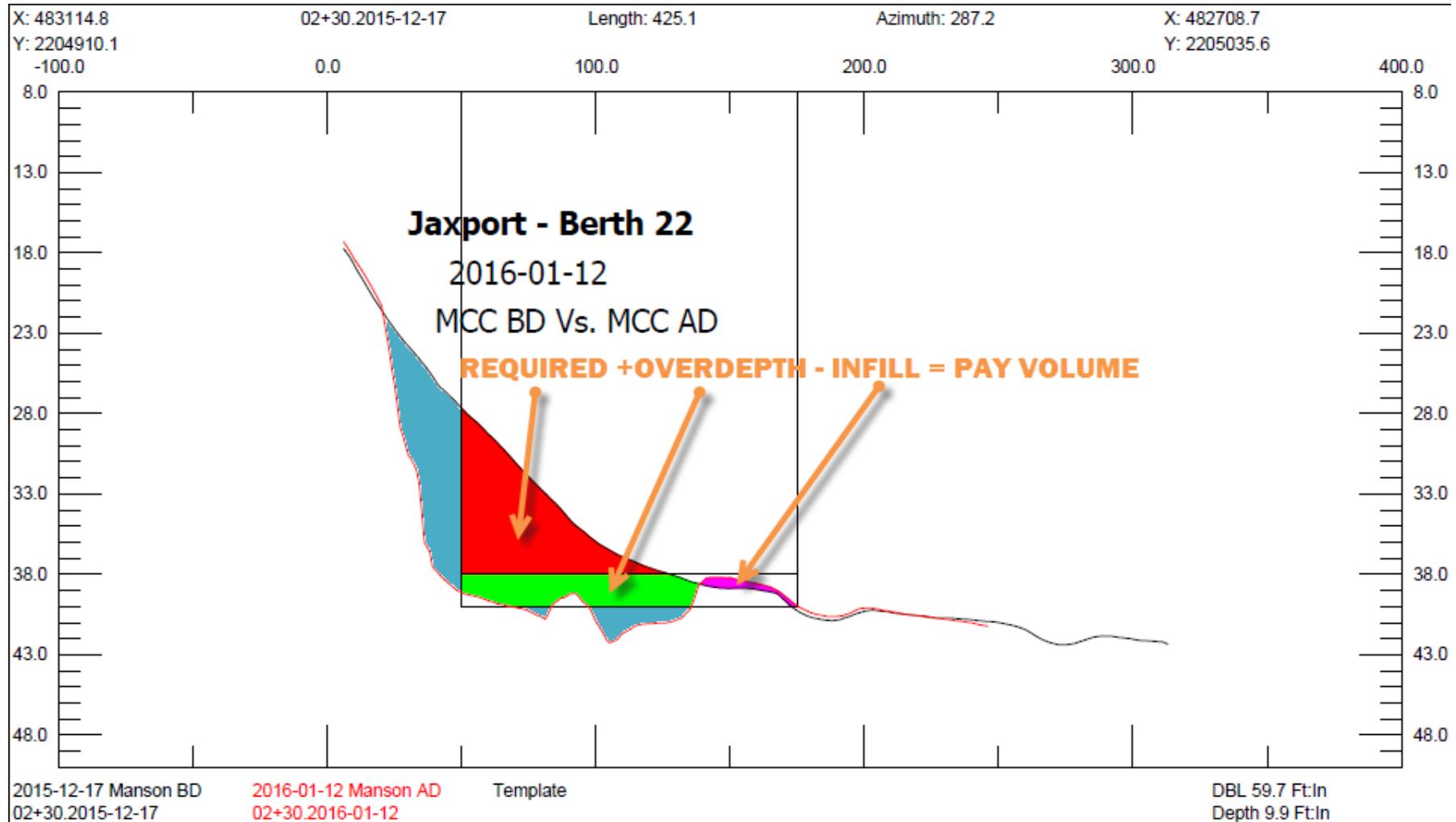
An Employee-Owned Company  
[www.mansonconstruction.com](http://www.mansonconstruction.com)

# Topics

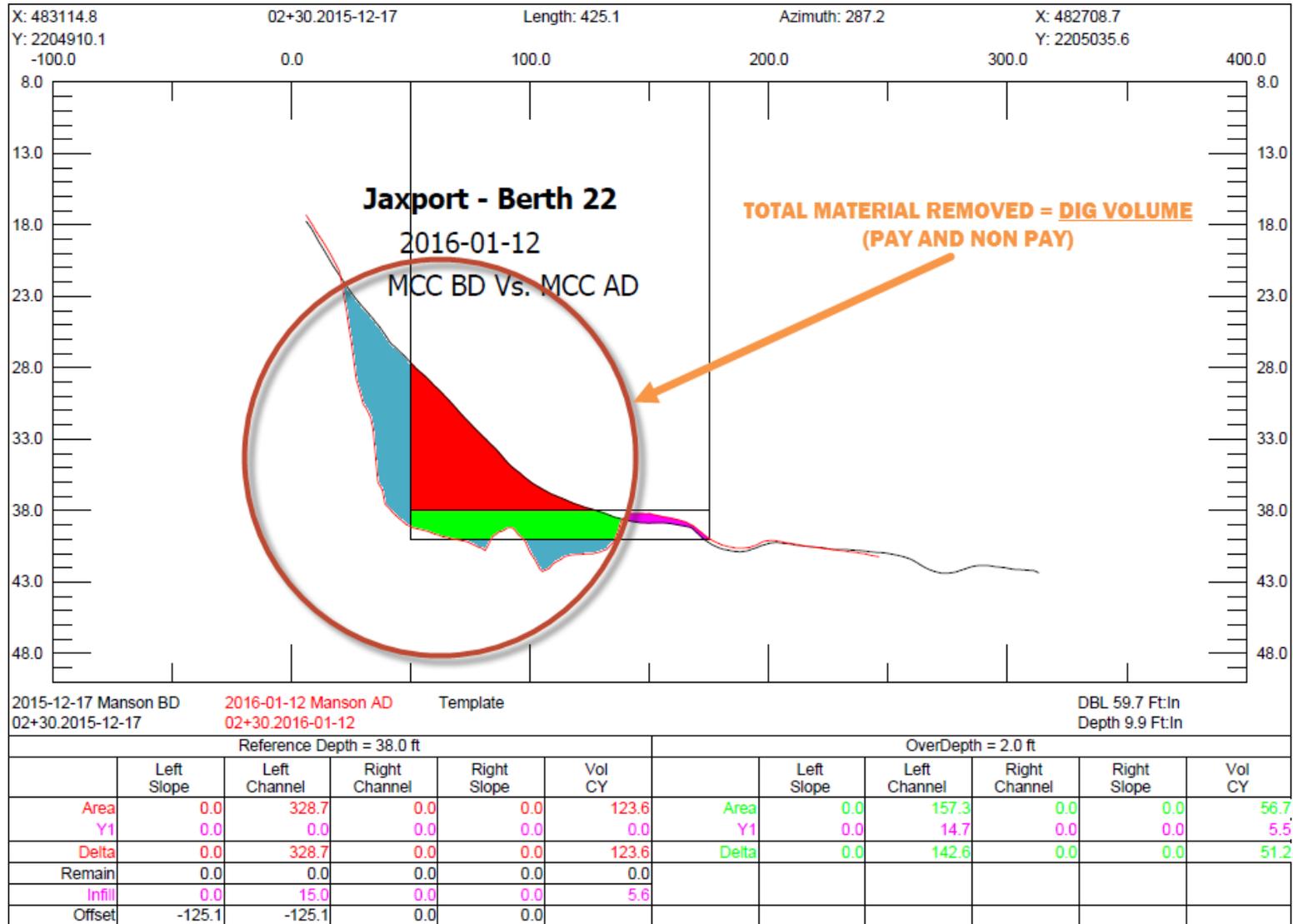
- Production, Quantities, & Cost
- Contractual Terms
- Regulatory Compliance
- Technical Papers, Memos, & Government Guidance
- Quantitative Analysis
- Contractor Recommendations
- Owner Perspectives
- Questions



# VOLUMES 101 – PAY VOLUME



# VOLUMES 101 – DIG VOLUME



# Misconceptions

- “Material removed from this allowable overdepth is paid under the terms of the dredging contract. Material removed beyond the limits of the allowable overdepth is not paid.
  - The contractor estimates a quantity of material to be dredged in order to achieve the required grade elevation regardless of what is paid or not paid.
    - The ratio of non-pay quantity is factored into the unit price that the client pays to have an area dredged.



# THEORETICAL CALCULATIONS

Sample Dredge Area			
Area (SF)	Grade QT	1' O.D. QT	2' O.D. QT
1,000,000	129,630	37,037	74,074

<u>0' Paid O.D.</u>			
Leave In (CY)	Overdig (CY)	Dig/Pay	Overdig(FT)
0	83,333	1.64	2.25
<u>1' Paid O.D.</u>			
Leave In (CY)	Overdig (CY)	Dig/Pay	Overdig(FT)
9,259	55,556	1.35	1.50
<u>2' Paid O.D.</u>			
Leave In (CY)	Overdig (CY)	Dig/Pay	Overdig(FT)
18,519	27,778	1.15	0.75

Line Item:	Cost:	Paid QT	\$/CY	Dig CY
0' Allowed	\$1,000,000	129,630	\$7.71	212,963
1' Allowed	\$1,000,000	157,407	\$6.35	212,963
2' Allowed	\$1,000,000	185,185	\$5.40	212,963

# RISK = \$\$

- Risk = More Dig CY than Pay CY = \$
- Risk = Less Allowable Paid O.D. = \$
- Risk = No Geotechnical Data Provided = \$
- Risk = Irrelevant Surveys = \$
- Risk = Max Permitted Depths = \$
- Risk = Ambiguous Line Items with O.D. = \$



ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	U/I	UNIT PRICE	AMOUNT
<b><u>BASE</u></b>					
<b><u>BID</u></b>					
1	MOBILIZATION AND DEMOBILIZATION DREDGING IN CHARLESTON ENTRANCE CHANNEL	1	JB	LUMP SUM	\$ _____
2	DREDGING OF UNCLASSIFIED MATERIAL IN CHARLESTON ENTRANCE CHANNEL SHOALS 5-8 (MAIN CHANNEL 49', 1' OD)	1,469,000	CY	\$ _____	\$ _____
<b><u>OPTIONS</u></b>					
5	DREDGING OF UNCLASSIFIED MATERIAL IN CHARLESTON ENTRANCE CHANNEL SHOALS 5-8 (CHANNEL WINGS 44', 1' OD)	711,000	CY	\$ _____	\$ _____
6	DREDGING OF AN ADDITIONAL 1' OVERDEPTH FOR SHOALS 5-8	448,000	CY	\$ _____	\$ _____



Please do not have an option to get paid additional dredge tolerance!

# WONKY BID SCHEDULES = WONKY BID \$'s

Simplified View:

Item No.	Description	Quantity	Unit	Contractor A		Contractor B	
				Unit Price	Est. Amount	Unit Price	Est. Amount
CLIN 0002	Dredging Shoals 5-8 (Main Channel 49', 1' OD)	1,469,000	CY	\$3.80	\$5,582,200	\$3.70	\$5,435,300
	Total Base:				\$5,582,200		\$5,435,300
CLIN 0006	Dredging of an Additional 1' Overdepth for Shoals 5-8	448,000	CY	\$0.00	\$0	\$2.20	\$985,600
	Total Option:				\$0		\$985,600
	Total Base + Option				\$5,582,200		\$6,420,900

Note: Contractor A won the job by \$1,060,850 - So still would have won even if they had not put that option in.

“The Work **required** by **Optional** Bid Item 0006 shall include the removal and disposal of all material within the additional 1 ft of **overdepth** for shoals 5-8.”

# ER 1130-2-520 Published November 29, 1996

- (3) When provisions for allowable overdepth below the required prism are specified, the quantities shall be firmly established in the bidding documents. The removal of these quantities by the contractor are optional; however, the contractor will be paid for all material removed within the allowable overdepth prism. **The required and allowable overdepth quantity of material should be included in the same bid item**, and these quantities should be noted in the contract specifications. The contract specifications will state that no payment will be made for material removed outside the allowable overdepth prism.

0002 Dredging, Reach 1 to -50-ft (MLLW) including 1-foot of Paid Overdepth with disposal at a Beneficial Reuse Upland site.

0002AA Required Dredging to -50-ft MLLW at Oakland Harbor 58,000 CY \$ \_\_\_\_\_ \$ \_\_\_\_\_

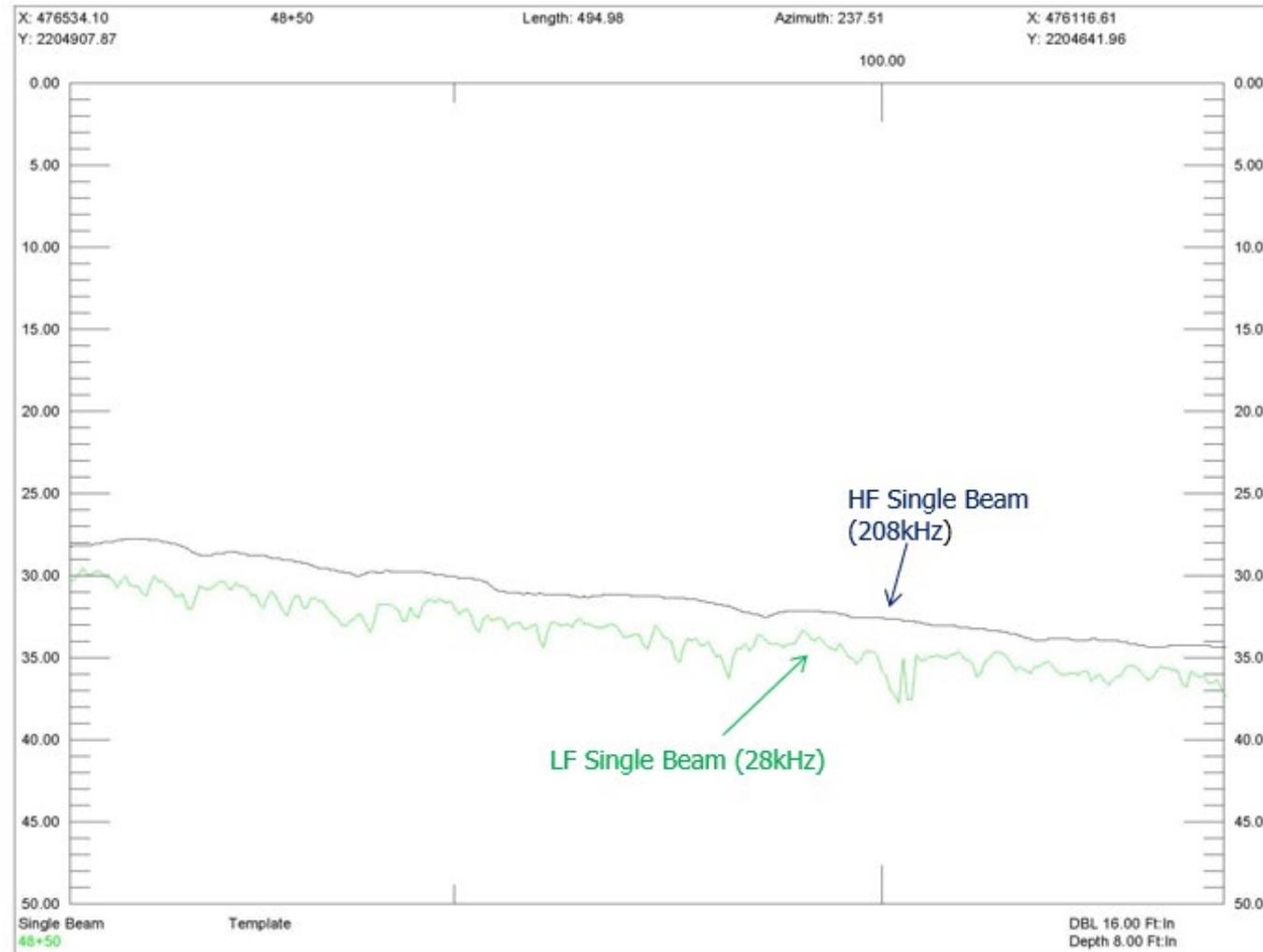
0002AB Overdepth Dredging to -51-ft MLLW at Oakland Harbor 140,000 CY \$ \_\_\_\_\_ \$ \_\_\_\_\_

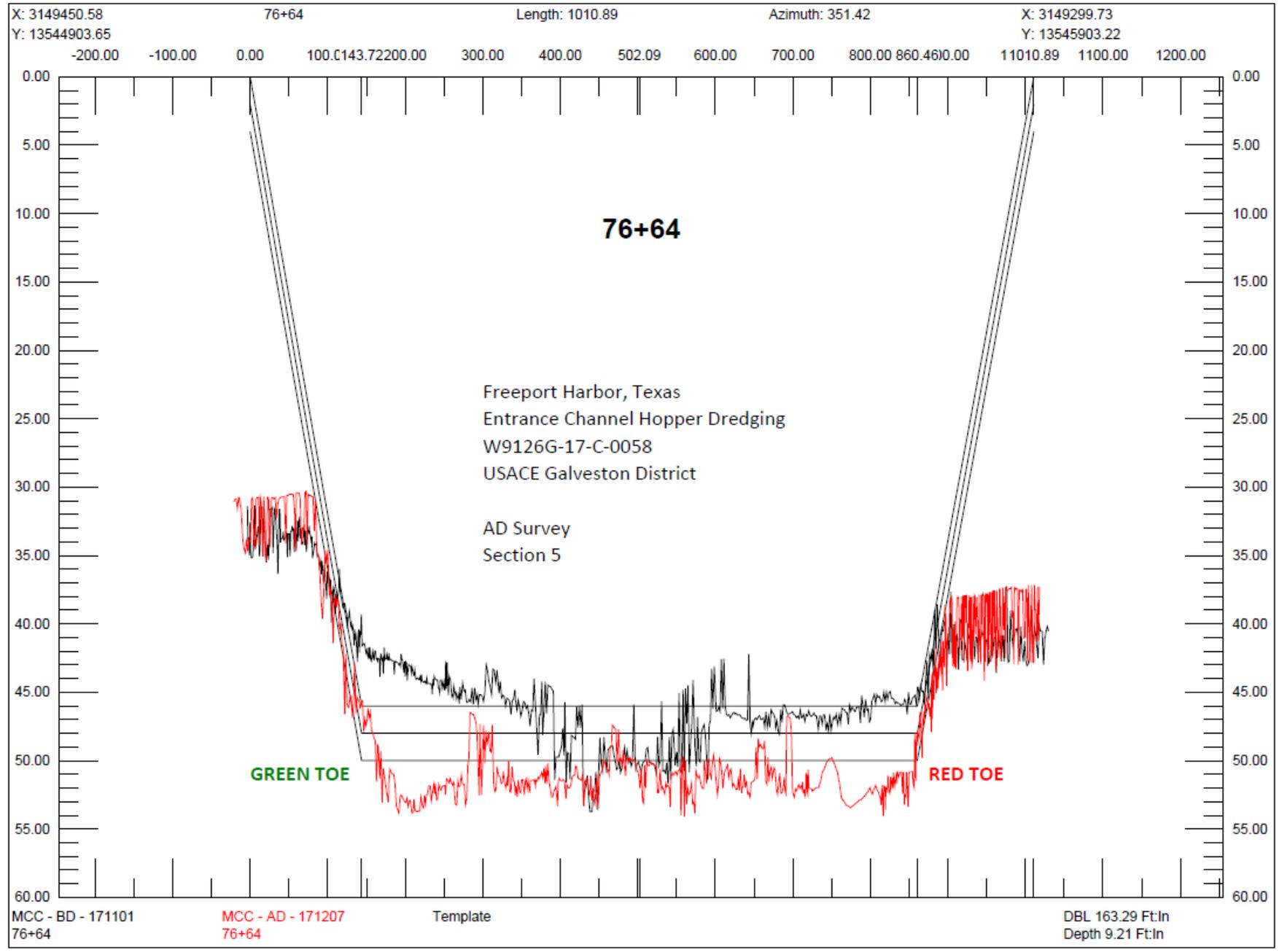
**Better Alternative:**

0002 Dredging, Reach 1 to -50-ft (MLLW) including 1-foot of Paid Overdepth 198,000 CY \$ \_\_\_\_\_ \$ \_\_\_\_\_



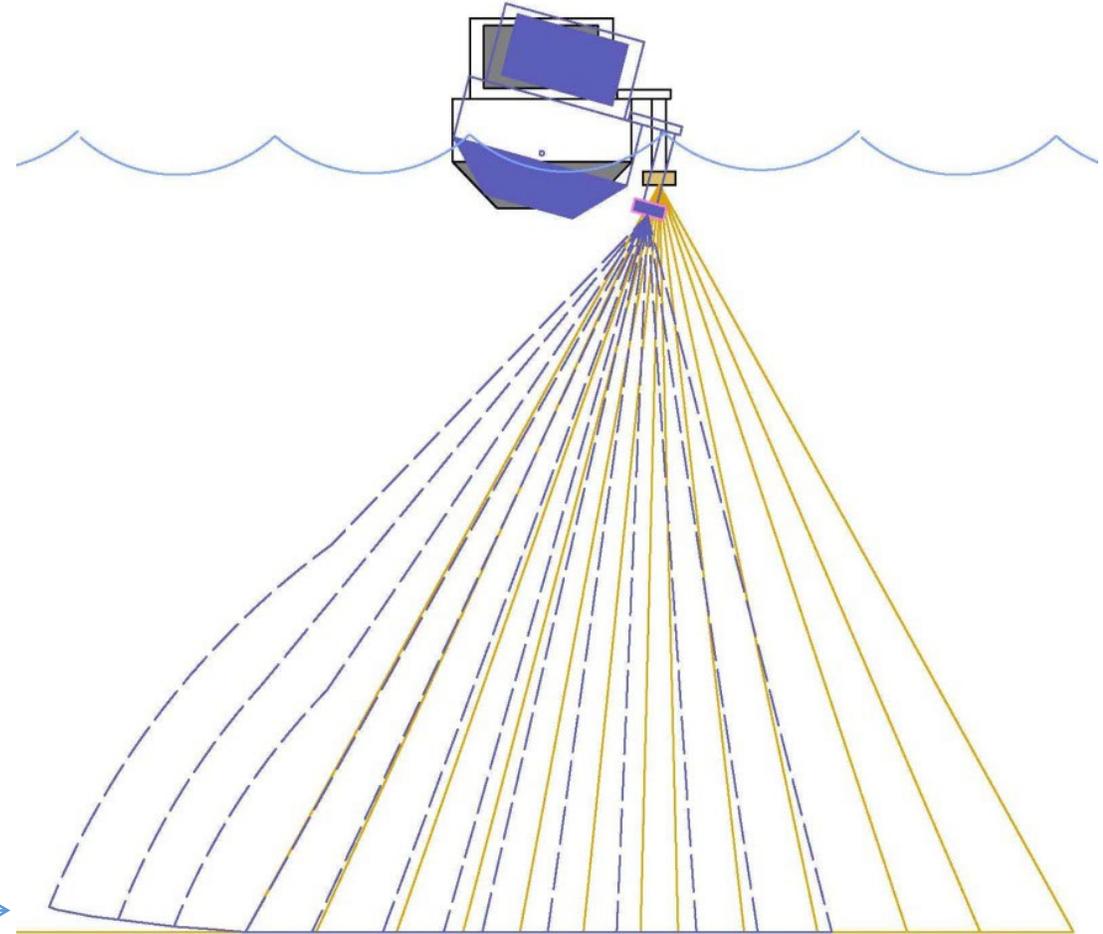
# Unconsolidated Material - High vs. Low Frequency



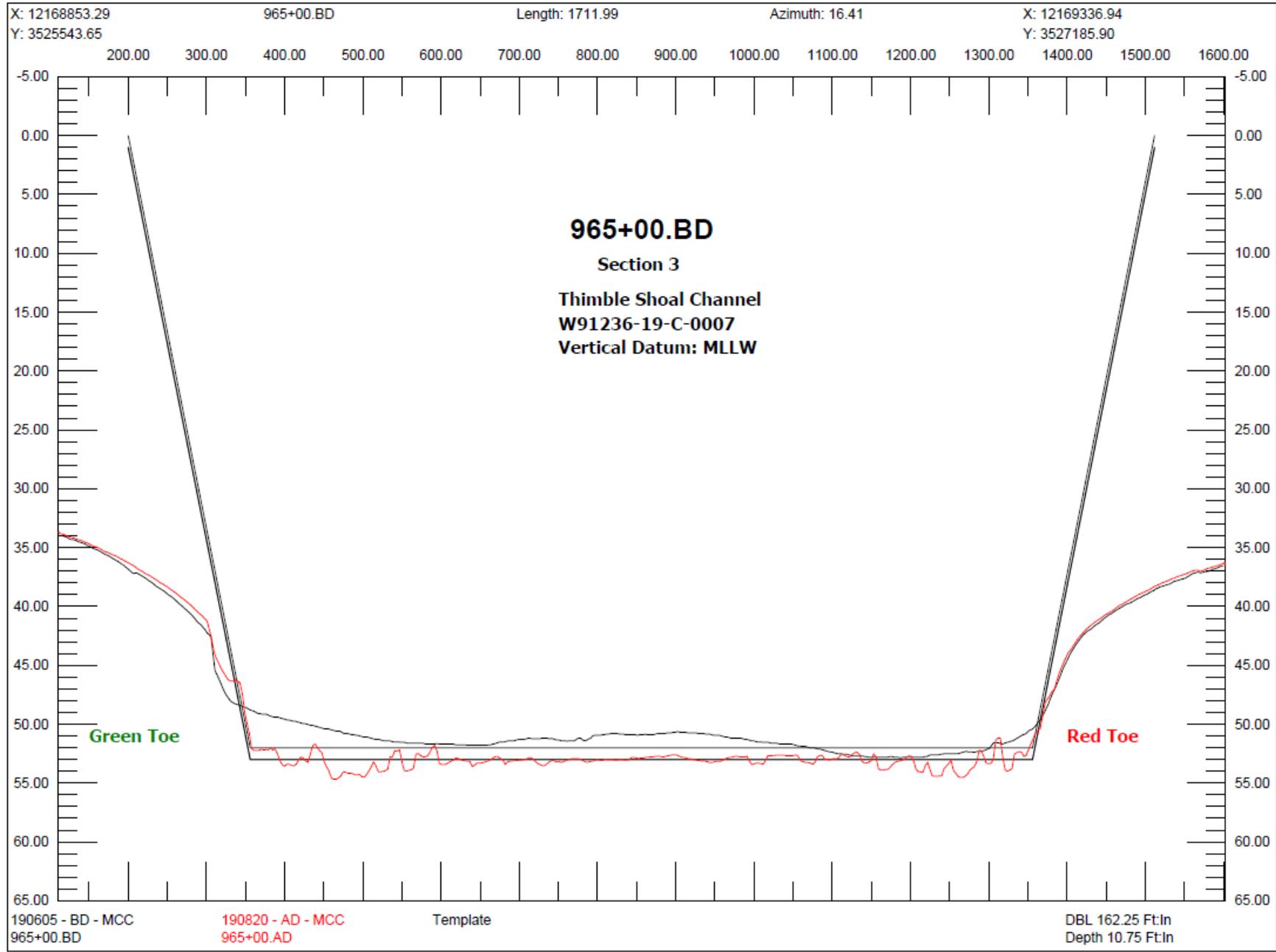


# Multi-beam Beam Surveying

- Errors inherent in Multi-beam Surveys:
  - Beam spreading
  - Beam distortion through water column
  - Sea-State induced motion errors
  - Non-uniformity of dredged bottom can lead to inconsistencies



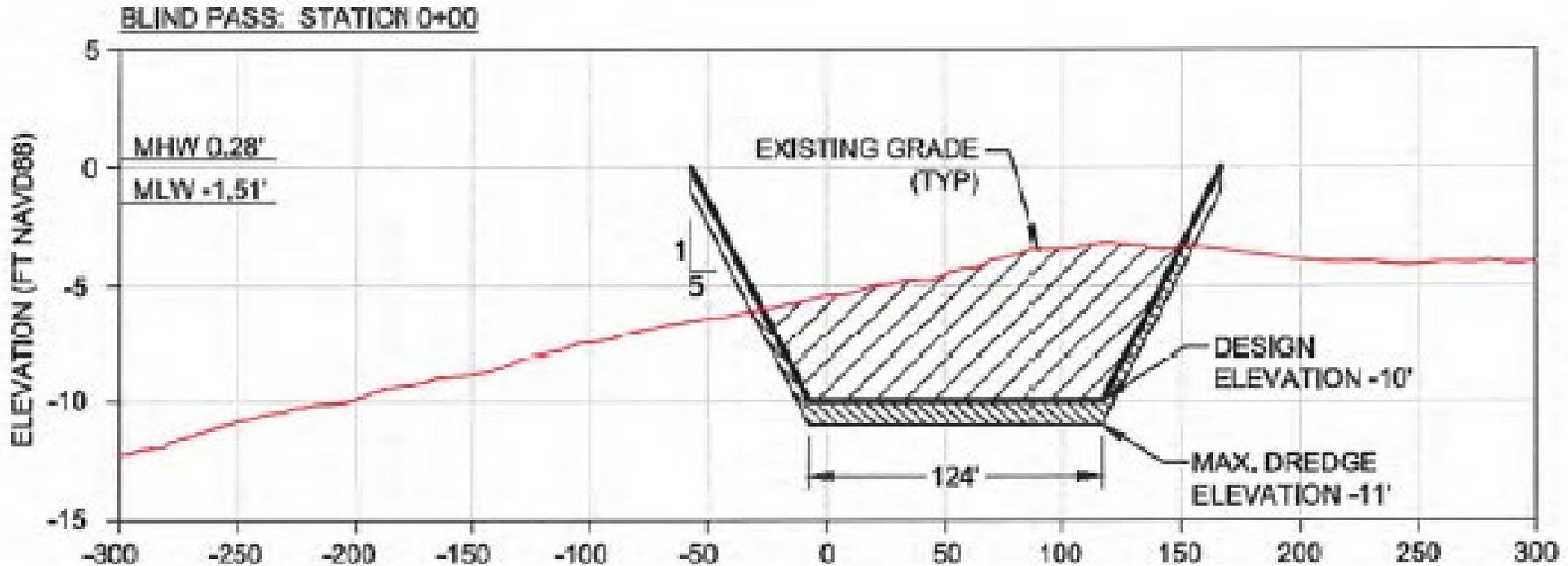
Potential Vertical Error



# ER 1130-2-520

- (1) The Contracting Officer shall require the contractor to remove any and all material from within the required prism as required by the contract specifications. However, **at the discretion of the Contracting Officer, the contractor may be released from removing all the material in the required prism** based on navigation requirements and other factors, such as: **deviations from the maintained dimensions can be attributed to the inaccuracies in the surveying measurement process, material characteristics, extreme weather conditions**, or when the government is at fault.

# What do you see that is wrong with this?



### **TS- 7.3.2 DREDGE LIMITS COMPLIANCE**

No excavation shall occur below the permitted maximum dredge depth or outside the permitted dredging limits defined in the Contract and Permits. This provision does not apply to the slopes of the dredge cut; that is, the Contractor will not be held responsible for sand running from outside the dredging area limits when they are excavating at an edge of a dredging area. Material that is excavated from unpermitted areas will not be paid for under this Contract. Excavation in such an area is a violation of Permits for this Work. The Owner will perform pre-dredge and post-dredge surveys. If surveys and construction observations determine that excavation has been performed outside or below the permitted limits resulting in placement of non-compatible beach fill, the quantity of material dredged from these areas will be computed and subtracted from the pay quantity. Locations outside and below the permitted limits of the dredge site may contain material deposits that are undesirable for beach nourishment. Further, the Contractor shall remediate the beach fill sites to remove non-compatible beach fill excavated from unpermitted areas as required by the Permit agencies and at the Contractor's expense.

### **TS- 7.3.3 PERMIT VIOLATIONS**

Non-compatible beach fill shall be determined by the Permit agencies and Owner based on the compatible beach fill definition. The Contractor will be required to compensate the Owner for any costs, fines, or other expenses related to Permit violations resulting from Contractor failure to comply with the Permits and/or associated with dredging outside or below the permitted dredge limits. Compensation will be in the form of a deduction from any payment due or to become due to the Contractor or may be recovered under the Contractor's bond

# Proposal Language

- Some amount of incidental excavation beyond 2' from the required grade is to be expected. This issue was the subject of much discussion several years ago and language deemed acceptable to industry, USACE and regulators has been “the contractor will be responsible for any fines for over excavation if progress surveys reveal repeated, continuous, and intentional excavation below the maximum permitted depth.” Our price assumes this will be the measure of whether or not fines are levied for incidental dredging beyond the maximum permitted depth.”



# Dredge Depth Accuracy Is Impacted By:

- Quantity of material above grade & the layout of material in channel
- Geotechnical parameters
- Dredging depth
- Location of the dredging site (offshore, inshore, lake, etc.)
- Physical environment (waves, tides, currents)
- Type of dredge available to do the work
- Hydrographic surveying & positioning available
- Level of quality control used to monitor data quality
- Experience level of dredge operators

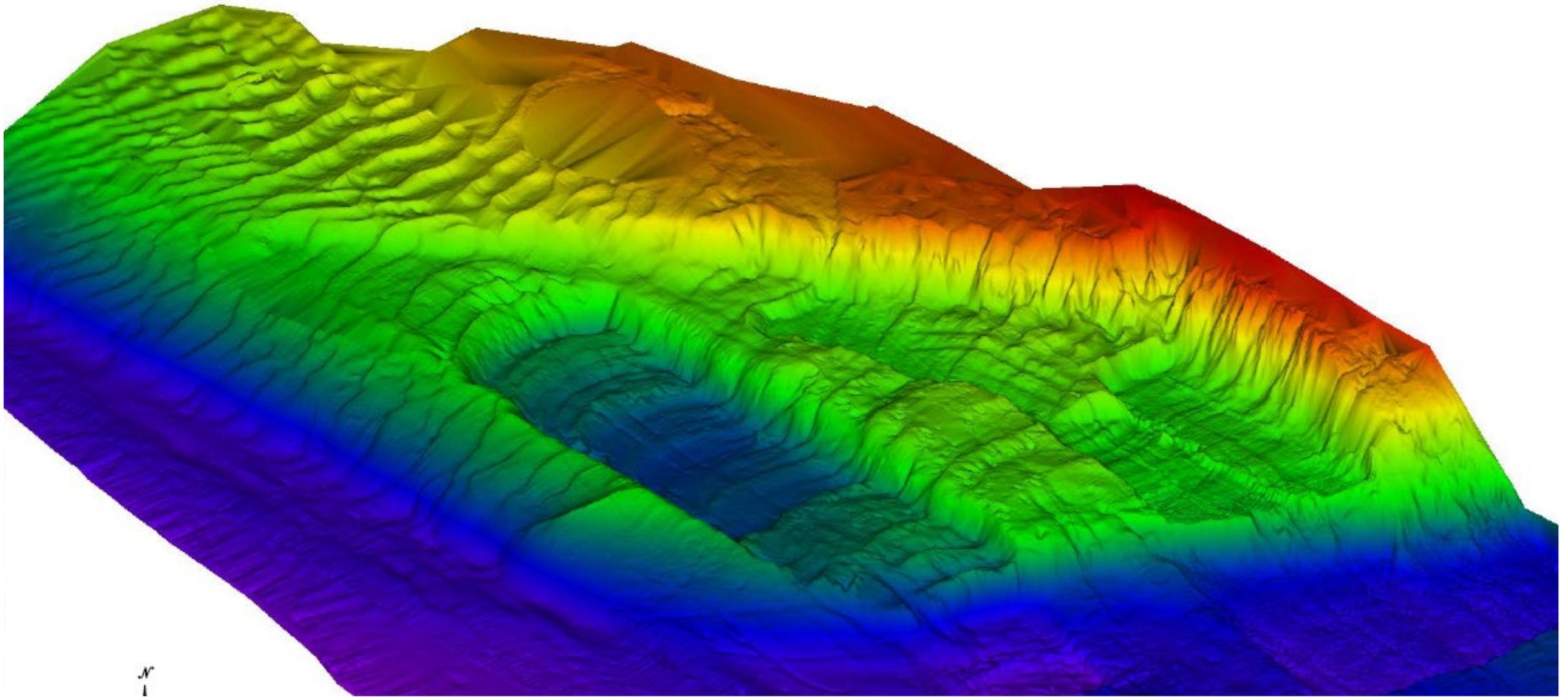
# Contractor Suggestions

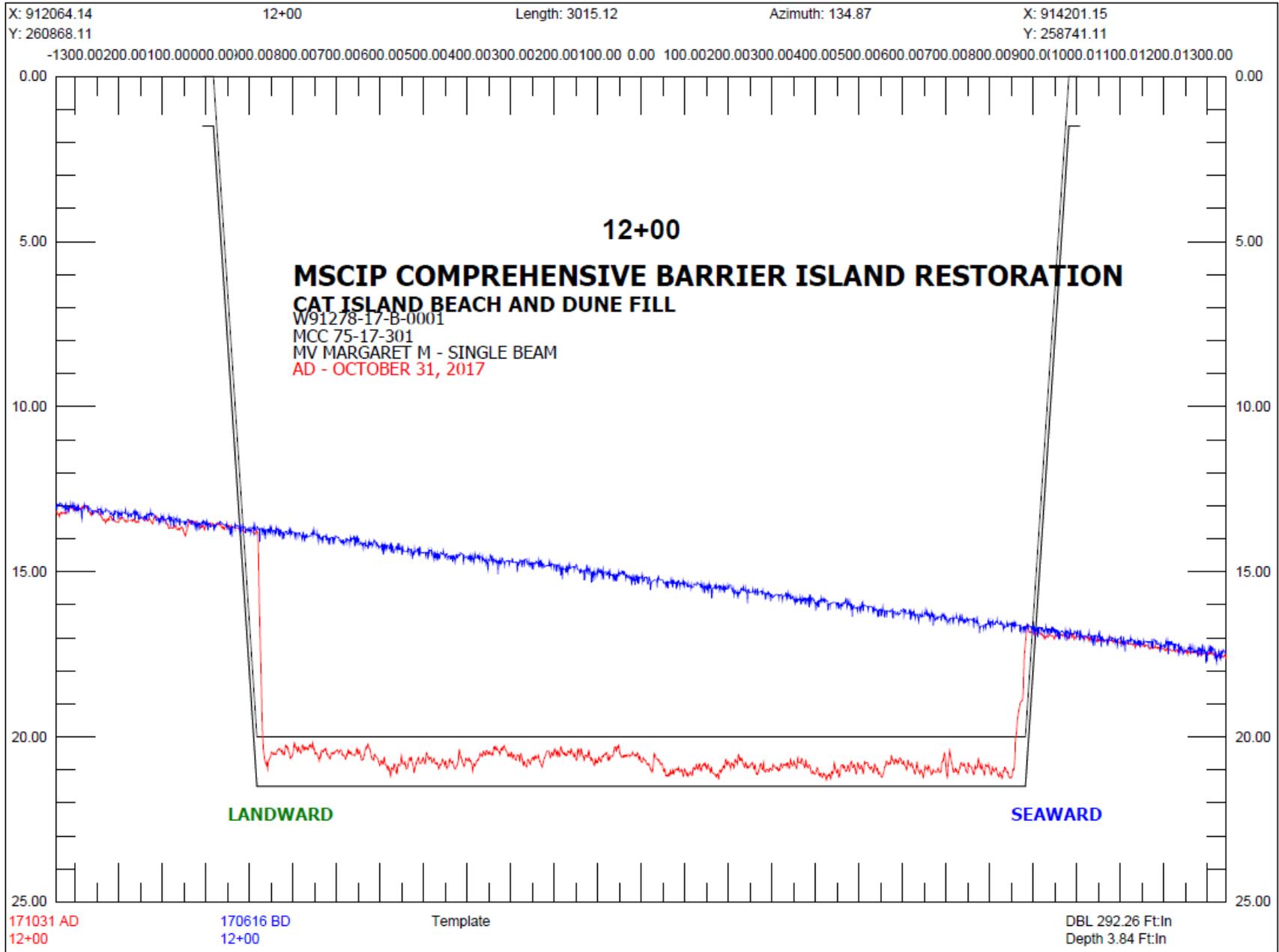
- Optional Line Items to increase required depth.
- Maintain a 2 foot allowable paid overdepth below the required.
- Allow box cutting on slopes & an allowable overdepth on slopes.
- Characterize and permit 4-5 feet below the allowable overdepth for incidental overdredging.
  - When contractors perceive potential incidental overdigging as a permit violation it increases cost & potential lack of competition due to contractors not wanting to knowingly win a job that they will violate a permit.

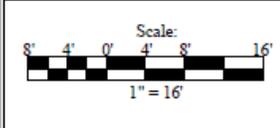
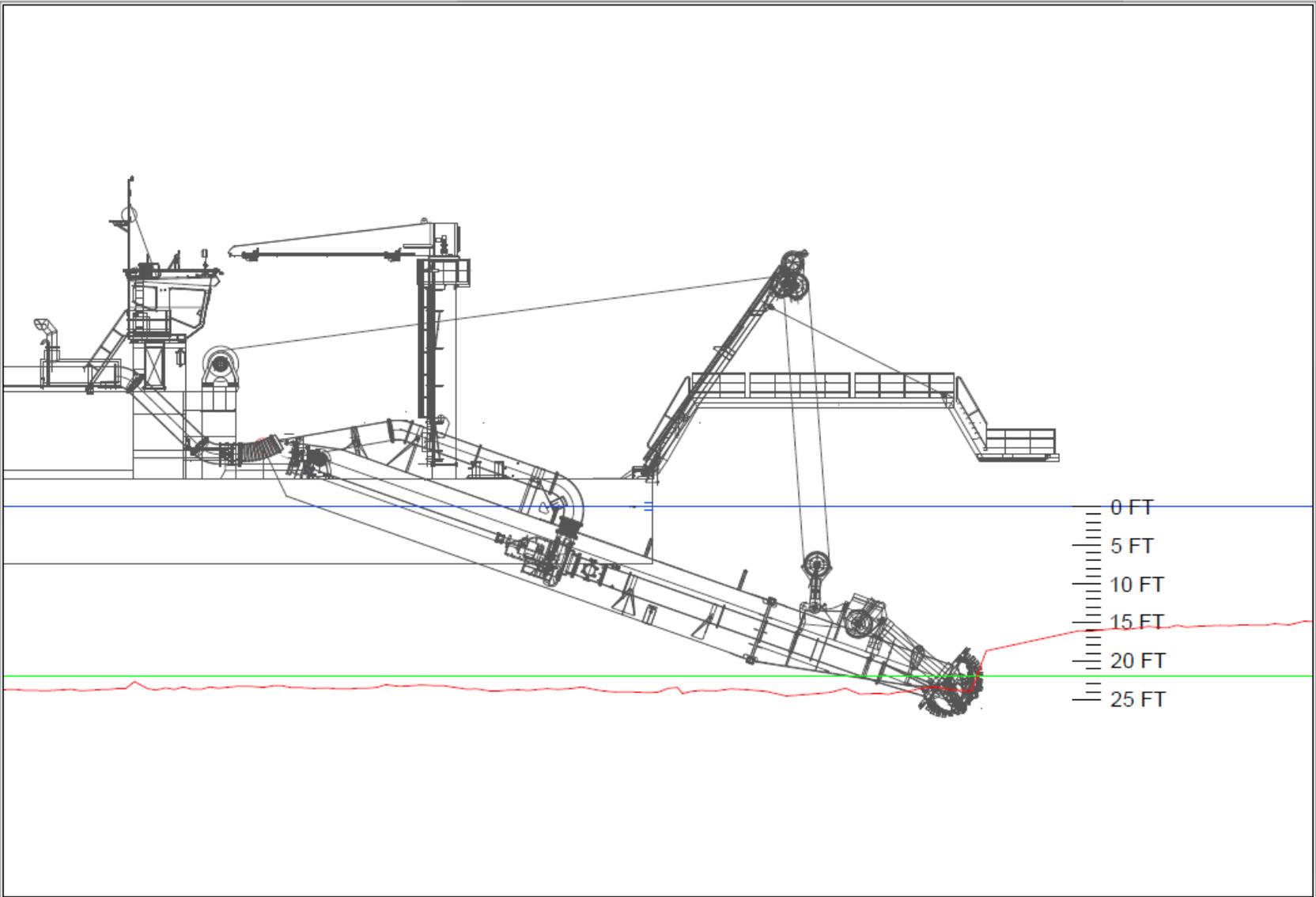
# Client & Regulatory Perspective

- “They don't get any benefit out of overdepth dredging so why should they pay for it?
  - If they don't pay for it, aren't they incentivizing contractors as an industry to get more accurate?
    - Leading to less disposal of dredge material...which is all good from the regulator perspective?
- By paying for OD, aren't they rewarding inaccuracy and taking away any motivation to get more accurate?









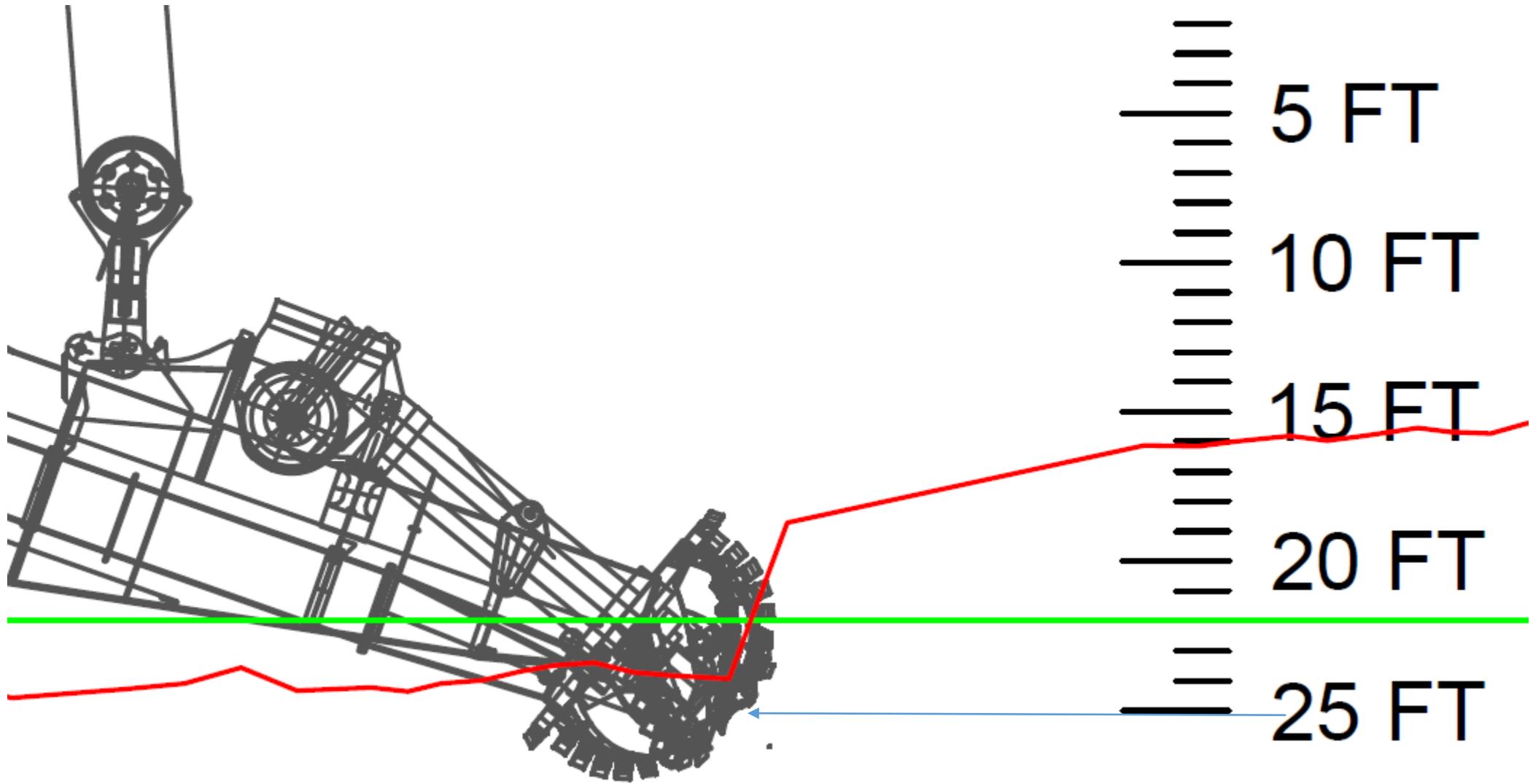
**Dredge Robert M. White**  
 Atchafalaya Bar Channel  
 Spillage

Notes:  
 Survey Date: 2019-08-05  
 Plot Date: 2019-10-24  
 Drawn By: NV  
 Checked By: JH  
 Drawing Name: RM White Atchafalaya Spillage.dwg

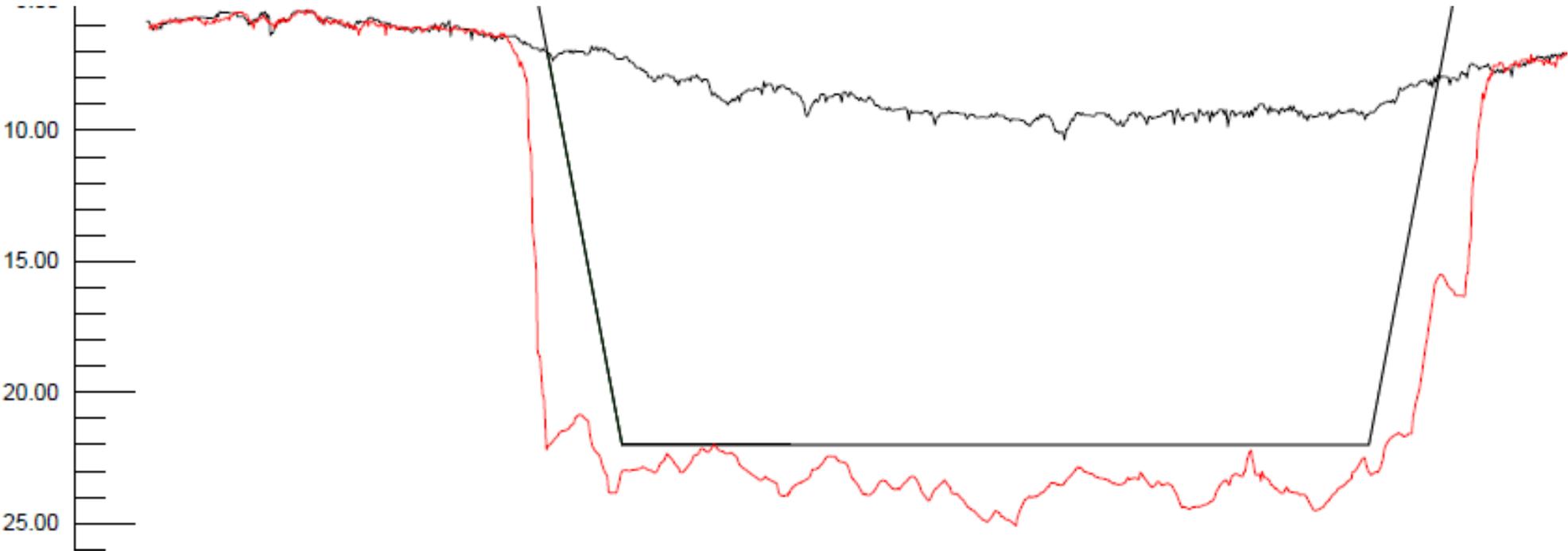
Cutter depth set to -25 FT on single pass pattern.  
 — Centerline AD Profile Survey  
 — Grade (-22 FT)

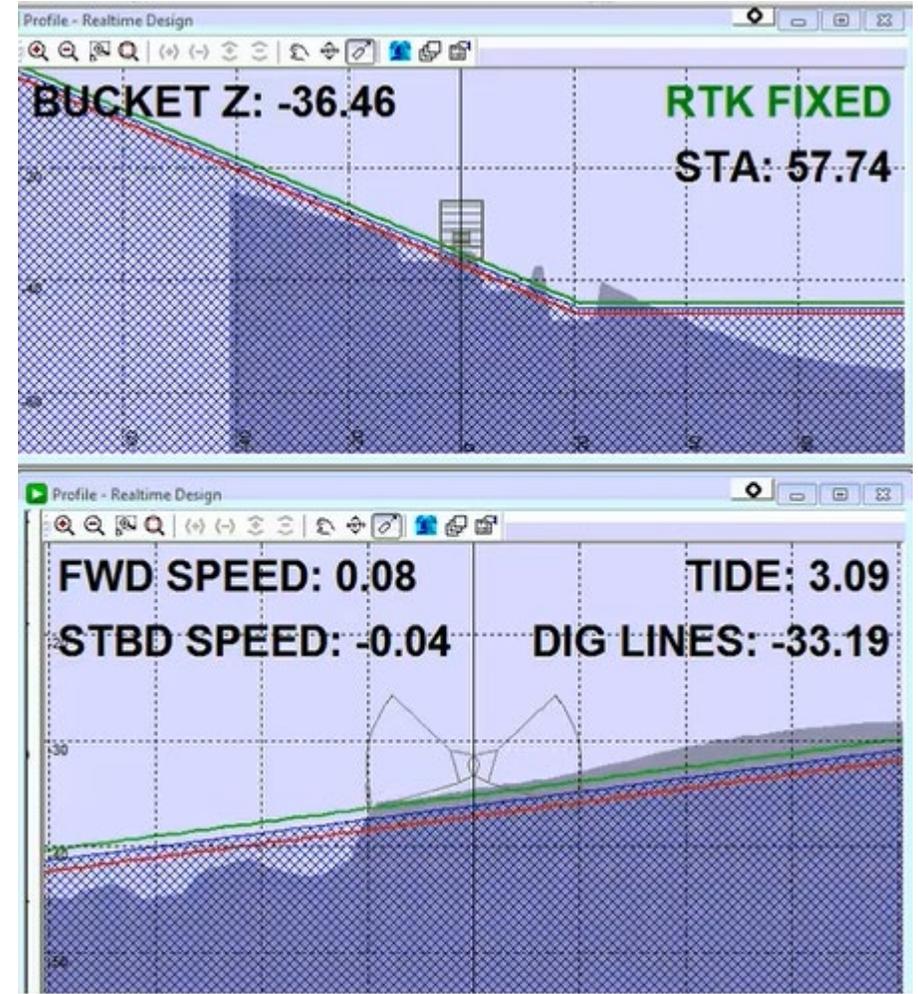


Sheet  
 1 of 1



# No Paid Overdepth – Example Cross Section





X: 466043.57

04+70.20190607

Length: 469.90

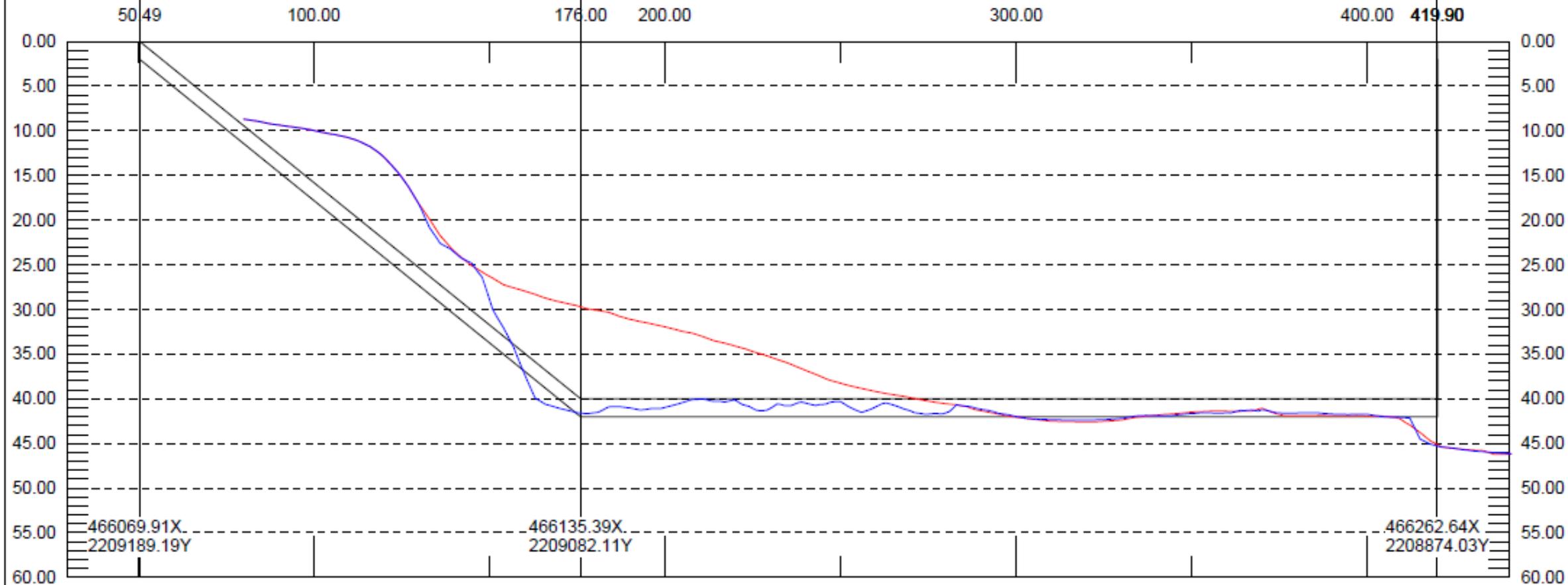
Azimuth: 148.55

X: 466288.72

Y: 2209232.26

Y: 2208831.38

DBL	50.49	176.00	419.90
Tmp	0.00	40.00	40.00
1		29.70	45.14
2		41.61	45.29



20190607 BD - MCC  
04+70.20190607

20190617 AD - MCC  
04+70.20190617

Template

DBL 44.65 Ft:In  
Depth 17.50 Ft:In

Reference Depth = 40.00 ft

OverDepth = 2.00 ft





# Typical Digging Curve – Clamshell Bucket









# CONTACT INFO

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Estimating Manager  
Manson Construction Co.  
904-821-0211  
[Khowell@MansonConstruction.com](mailto:Khowell@MansonConstruction.com)

