

MEMORANDUM THRU: CO-M
CO

TO: FILES

SUBJECT: Potential alternatives for Galveston Beach Fill Job to Decrease Costs.

1. Recently the City of Galveston requested bids for construction a beach between 10th and 61st streets. The borrow area was located east of the landward portion of big reef and north of the south jetty (Figure 1). Bid prices were well above the estimated cost to complete the job. Contractors complaints on the job mainly centered on depth of cut available to complete the job, pipeline length, contractor liability and weather conditions. To reduce the cost of constructing a beach at Galveston some alteration will need to be conducted of the bid package.

2. Depth of Cut. Currently the depth of cut is limited by the proven availability of sand. The estimated average depth of cut for the project is approximately 4ft, reviewing the permit request. A large dredge, which would be required to complete this job, would more efficiently have a depth of cut between 8 to 12 ft. To increase the depth of cut an increased depth of sand would need to be proven at the site. Sediment cores collected prior to request for bids were limited by a stiff layer of material which could not be penetrated by the core. Additional cores may prove that additional sand is available below the stiff layer. Four to ten cores should verify what is below the stiff layer.

Benefit: Increased depth of cut would allow for a more efficient dredging operation, reducing costs. Would require minor permit modification, as long as emergent portion of big reef not affected.

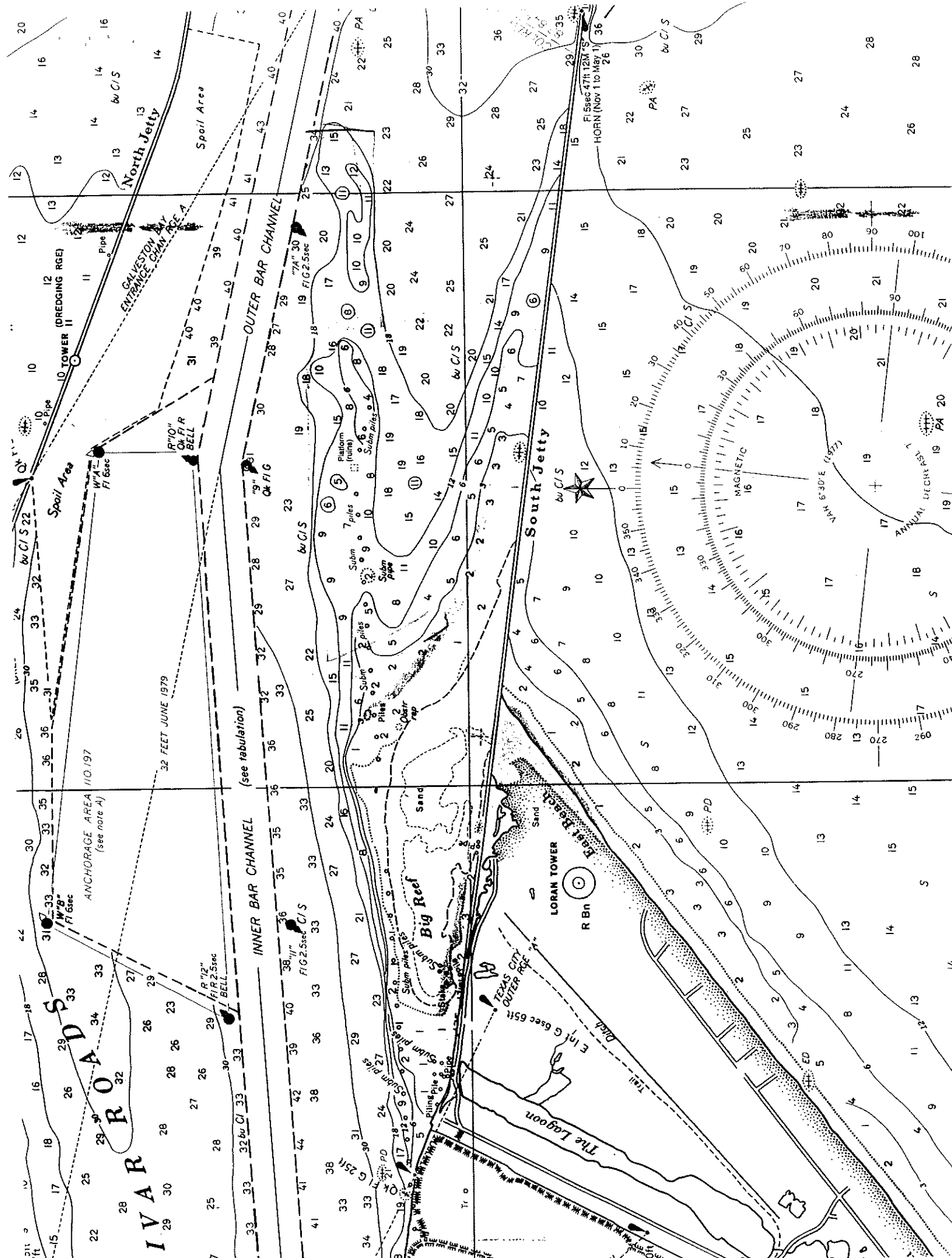
Drawbacks: Additional sediment sampling and analyses would increase design costs and time to complete job.

3. Pipeline length. Pipeline length can only be reduced by identifying a sand source closer to the fill location or a more direct route to the fill location. If an increased depth of cut can be determined feasible, then that portion of the borrow area closest to the beach can be used more, decreasing pumping distances. The only known borrow source available outside of the emergent portion of big reef would be the shoal west of big reef. NOAA charts, Figure 2, indicate that the shoal is located just west of the emergent section of big reef. Borrow from this area is less likely to cause problems with the emergent section of big reef and therefor a deeper borrow may be allowed. Pipeline lengths could be reduced by utilizing this borrow source and using an easement along the seawall to place the pipe. However,

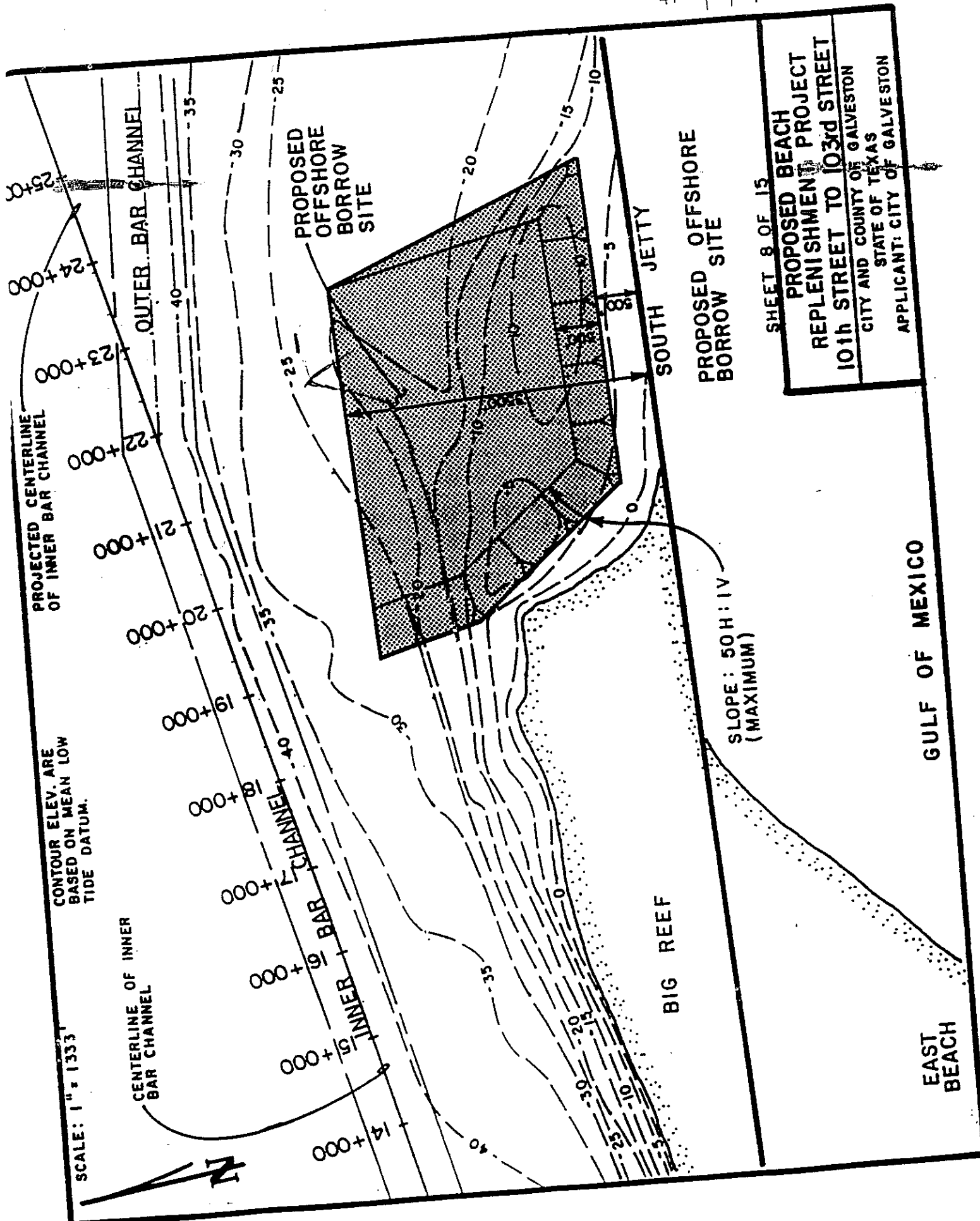
surveys would be required to verify the quantity of material available. If depth of cut is limited, most likely there will not be enough material to complete the dredging job. Benefits: Reduced pipeline lengths would decrease overall costs. Drawbacks: Deeper cuts at the existing borrow area will require increased sediment samples and some regulatory review. A borrow area west of big reef would require new surveys, sediment samples and most likely a whole new permitting process, delaying the project.

4. Contractor liability. Most of the concerns of the contractor were the amount of borrow available to complete the job and constructing the required templet. Contractor estimates indicated that not enough material was available to completed the job as contracted. One way to relieve this problem would be to make more material available for the contractor either through increased depth of cut or larger borrow area. NAOO charts, Figure 2, indicate a large shoal of material paralleling the south jetty near the outer bar channel. Including this shoal into the designated borrow area a larger amount of material would be available to complete the job, giving the contractor greater security. Estimates of required amount of material to construct the required templet were different between the contractor and consultant. This is of great concern to the contract as he is paid by the amount in the templet and his costs are associated with the amount of material pumped from the borrow area. Some of these concerns of the contractor may be alleviated by indicated a maximum amount of material placed into the fill location, ie paid by amount of borrow, or if required volume to fill templet exceeds some designated borrow volume the contractee has the option of paying for additional borrow or accepting the existing templet. This will provide the contractor with some assurances of what the maximum is required of him, limiting his liability. Benefits: By decreasing the contractors liability/risk they will be able to provide a better (more representative) bid. Drawbacks: Project may not be built to expected specifications. New Areas will require permit review.

5. Weather Conditions. Weather uncertainties are a problem with any job conducted outdoors. Along the Texas Coast two major weather conditions exist, northers and tropical storms. The first occurs in the fall and winter the second summer through fall. The borrow area is within protected waters between the two jetties limiting fetch distances. Limited fetch will reduce the size and intensity of waves. The size of dredge required to complete this job will be large enough to work within these wave limits. Along the beach front, any tropical storm will produce major problems, while northers will provide some problems. Strong south winds usually precede advancing northers. Once the front passes the wind direction changes quickly. Waves that were generated during the strong south winds are quickly reduced by the changing wind conditions. It is unclear what benefits or disadvantages could be accomplished by changing the time of construction.



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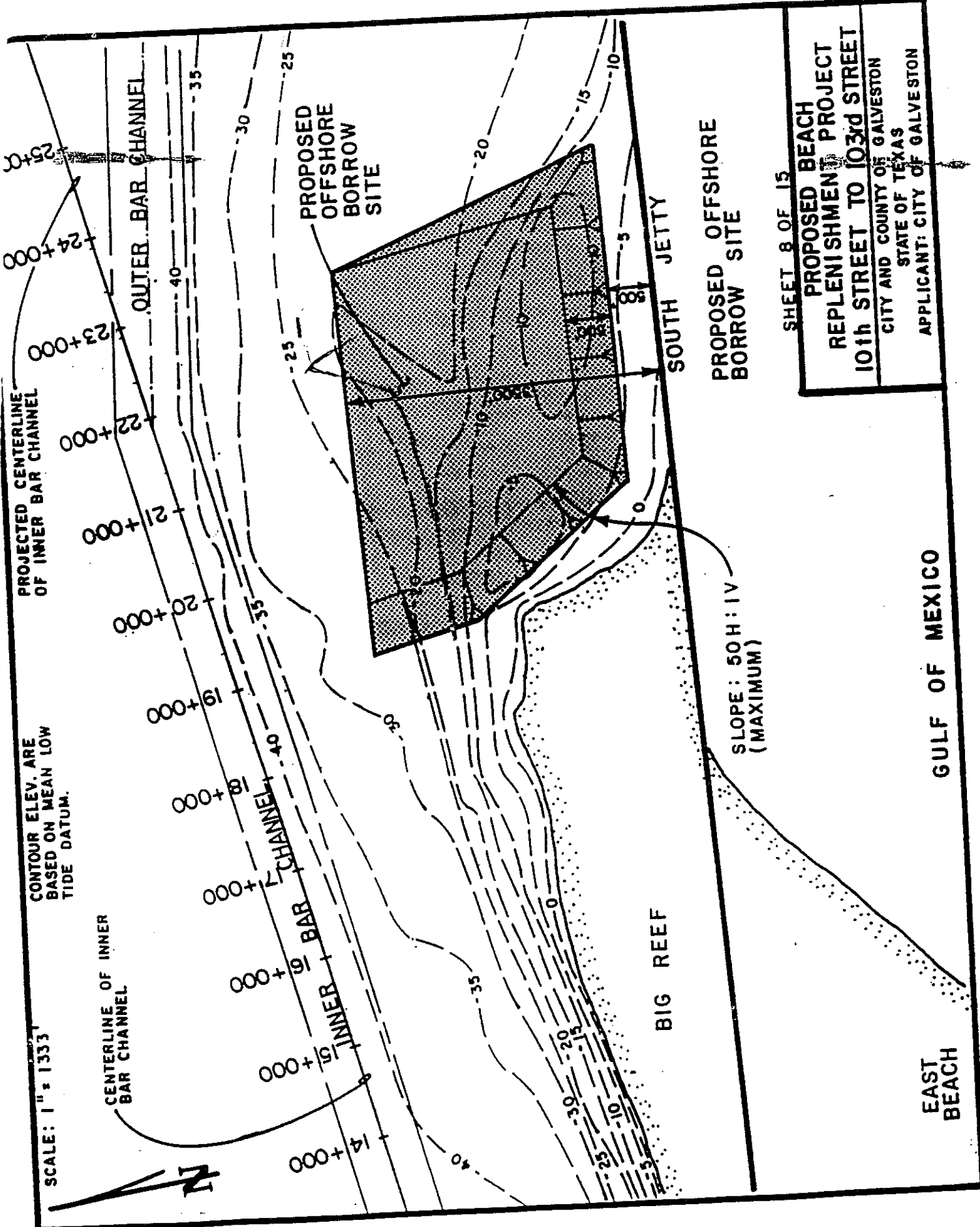
SHEET 8 OF 15

PROPOSED BEACH
REPLENISHMENT PROJECT
101h STREET TO 103rd STREET
CITY AND COUNTY OF GALVESTON
STATE OF TEXAS
APPLICANT: CITY OF GALVESTON

GULF OF MEXICO

EAST
BEACH

14721(04)



SHEET 8 OF 15

**PROPOSED BEACH
REPLENISHMENT PROJECT**

10th STREET TO 103rd STREET

CITY AND COUNTY OF GALVESTON
STATE OF TEXAS

APPLICANT: CITY OF GALVESTON