

BEFORE THE  
MARYLAND STATE BOARD OF CONTRACT APPEALS

Appeals of CLEVECON-AU-VIANINI )  
(A Joint Venture) )  
)  
)  
Under MTA Contract Nos. NW-06-04 )  
and NW-06-07 )

Docket Nos. MDOT 1007 &  
1013

January 7, 1983

Change - When Appellant failed to prepare foundations for its tunnel walls in accordance with the plan approved by the MTA engineer, the requirement that it thereafter conform to the approved plan did not constitute a change to the contract.

Contract Interpretation - The contract when read as a whole did not require the tunnel walls to be placed on firm, undisturbed rock. Appellant was entitled to place the walls in accordance with the alternate plan shown in the contract drawings or as approved by the MTA engineer.

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OPINION BY CHAIRMAN BAKER

This timely appeal concerns the interpretation of the contract plans and specifications relative to the construction of a permanent concrete tunnel liner for excavated rock tunnels. The specific issue which this Board is to decide concerns whether the MTA engineer reasonably rejected Appellant's plan to construct the walls of this tunnel liner on a base consisting of a layer of underdrain filter material placed over 2" coarse stone and tunnel muck. Quantum is not now in issue.

## Findings of Fact

### I. Introductory

On October 28, 1976, the Mass Transit Administration (MTA) issued a Notice to Contractors inviting bids on contracts numbered NW-06-04 and NW-06-07. These contracts were part of a series of contracts for the construction of the northwest line of the Baltimore Region Rapid Transit System. Contract number NW-06-04 involved construction of approximately 6,620 linear feet of rock tunnel terminating at the south boundary of the Mondawmin Station project.<sup>1</sup> Contract number NW-06-07 involved the construction of approximately 6,300 linear feet of rock tunnel running north from the Mondawmin Station project boundary. These projects are referred to as the south and north contracts respectively.

On December 21, 1976, the lowest responsive and responsible bidder on both the south and north contracts was identified as the joint venture of Clevecon, Inc., Roger J. Au and Son, Inc., and Vianini Corporation, the Appellant herein. The contracts separately were awarded to Appellant on April 22, 1977.

### II. General Construction of Project Tunnels

Both the north and south contracts essentially were performed under the "drill and blast" method of rock tunnel excavation. This method involved the drilling of holes in the rock tunnel face for the placement of explosives. The subsequent detonation of these explosives pulverized sections of rock ranging in depth from 4 to 12 feet depending both upon the blast pattern selected and rock conditions. After this pulverized rock (shot rock) was removed from the tunnel, temporary steel support ribs were installed and tightened against the rock outline of the tunnels using wood blocking. Crown reinforcement also was utilized where rock conditions were unstable.

The removal of shot rock and the installation of the temporary support ribs both required the use of heavy machinery. In order to provide a relatively smooth riding surface for this machinery, Appellant established a haul road by spreading a layer of 2" stone as it proceeded with its excavation work.

After the foregoing work was completed, both contracts required the placement of horseshoe-shaped concrete support walls (tunnel liner). The temporary steel supports were to be incorporated within this permanent concrete structure. This and other design details for the tunnel liner were included in the contract documents.

Appellant constructed each section of the permanent tunnel liner in two concrete operations. The first operation involved the placement of starter walls along each side of the tunnels. These starter walls were curb-like in form and were poured in 150 foot lengths. The second operation

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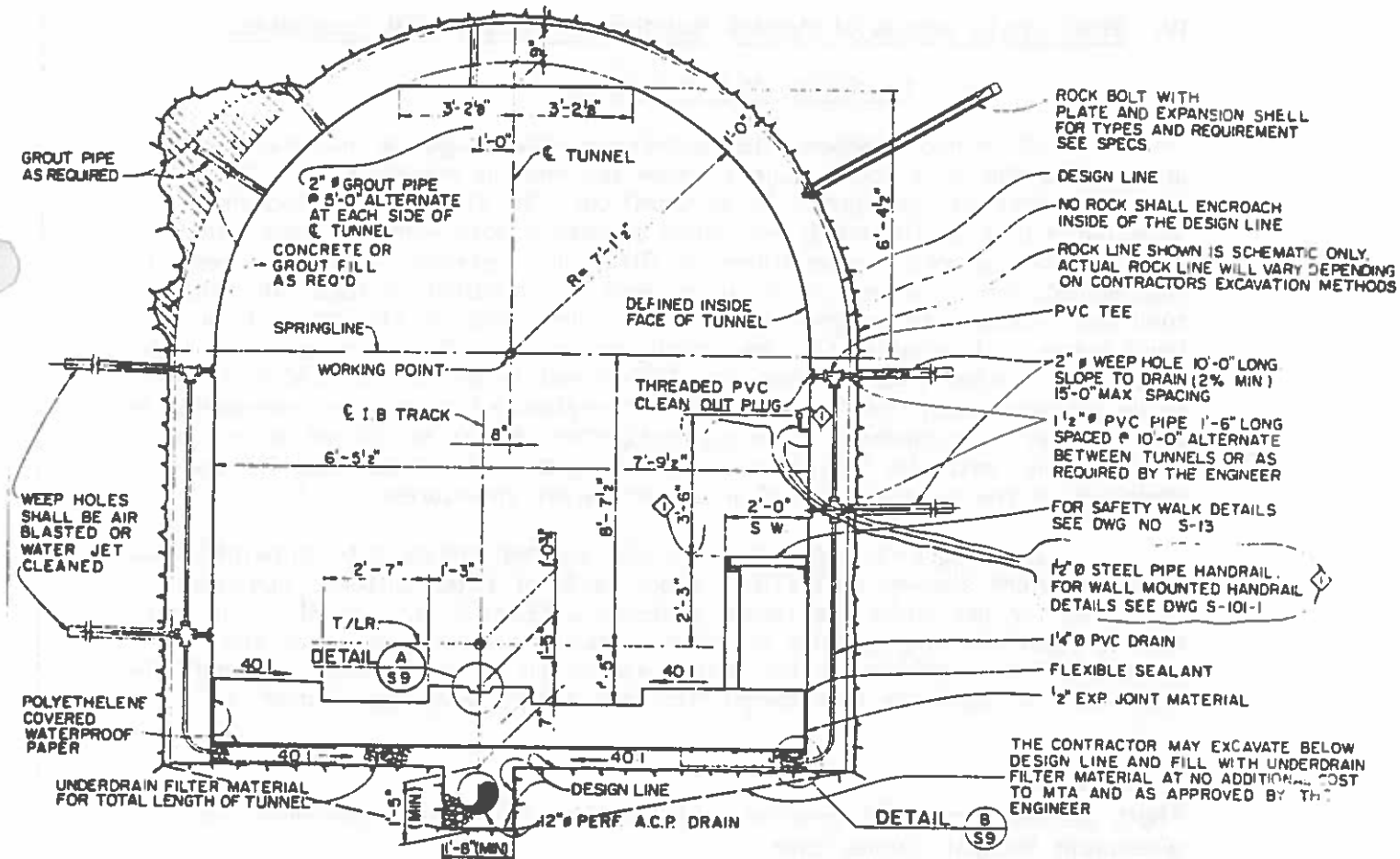
<sup>1</sup>The Mondawmin Station structure was to be constructed under another contract.

involved the monolithic placement of the upper walls along each side of the tunnel together with the arch connecting these two sidewalls. This portion of the tunnel liner was poured in 100 foot lengths.

In addition to the preceding elements of the work, two other activities were necessary to the tunnel construction and are of pertinence to this claim. First, Appellant was to construct a concrete invert slab between the tunnel liner walls. This invert was to form the bottom surface of the completed tunnel. Second, Appellant was to provide a drainage system to carry groundwater away from the tunnel structure. This involved the installation of a 12" perforated pipe, surrounded by underdrain filter material, to facilitate proper drainage. The perforated pipe was to run beneath the center of the tunnel invert for the entire length of each tunnel.

### III. Pertinent Contract Provisions

The tunnel typical details are identical in both sets of contract drawings and provide as follows:



(See north contract drawing S-11-1, sheet no. 100; south contract drawing S-9-1, sheet no. 100.) As is apparent, the rock line of the tunnel schematically is shown as tracing the outside limits of the completed concrete tunnel liner. These same typical details, however, expressly recognize that the actual distance between the rock line and design line may vary depending upon the blast pattern selected by the contractor. In this regard, the contract further provides that, in placing the concrete tunnel liner, the contractor must:

Fill enlargements of the tunnel excavation beyond the dimensions shown either with concrete or with grouted prepacking at no additional expense to the Administration and subject to the approval of the Engineer.

(Contract standard specifications, § 02990, ¶ 3.02).<sup>2</sup>

The tunnel typical details alternately permit the excavation to proceed beneath the design line of the tunnel invert and liner for ease in installing the drainage system.<sup>3</sup> This excavation area contractually could be filled with underdrain filter material, as approved by the Engineer.

#### IV. Pre-Dispute Action of Parties Relating to Starter Wall Foundation

##### A. Appellant's Bid Preparation

Mr. Vinton Garbesi was Appellant's chief engineer and construction manager at the time these projects were bid and his responsibilities included the supervision of Appellant's bid preparation. Mr. Garbesi testified that Appellant's bids on the north and south contracts both were premised upon founding the concrete tunnel liners on filter bed material rather than rock. In this regard, the 2" coarse stone to be used by Appellant to form the haul road was intended to be graded, from one tunnel wall to the other, to a level below that required for the installation of the 12" perforated drain pipe. Where this graded stone further was determined to be soft or muddy, it was to be replaced with fresh stone. The 12" perforated drain pipe, surrounded by an 18" layer of underdrain filter material, then was to be placed on top of the 2" stone, with the filter material forming the immediate base for construction of the concrete tunnel liner and invert structures.

In support of this testimony, Mr. Garbesi referred to Appellant's bid estimate which showed that 17,695 cubic yards of filter material had been estimated for use under the tunnel structure. (Exh. 3, p. 5 of 6). This was said to represent the quantity of filter material necessary to place the planned 18" base course for the length and width of the tunnel. Although the MTA did not challenge this computation and estimate at the hearing, it

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<sup>2</sup>Both parties agree that grouted prepacking would not be appropriate for placement beneath tunnel liner.

<sup>3</sup>North contract drawing S-11-1 is not as clear as south contract drawing S-9-1 with regard to the alternate excavation line. The lack of clarity appears to be the result of a drafting or printing defect. Nevertheless we are satisfied that the alternate excavation line extends at least to the design line of the concrete tunnel liner wall and we so find.

argued in posthearing briefs that the bid estimate is insufficient to establish Appellant's pre-bid interpretation of the contract. In weighing the evidence of record, however, the Board is satisfied that Mr. Garbesi's testimony, considered with the bid estimate, establishes that Appellant planned to pour the tunnel liners on filter material rather than undisturbed rock and we so find.

#### B. Appellant's Purchase of Concrete Forms for Starter Wall

During performance of the tunnel excavation work and prior to the onset of this dispute,<sup>4</sup> Appellant designed and ordered the concrete forms which it later used for the construction of the starter walls. These forms were designed to be anchored to the tunnel ribs and extend downward to a point just below the sub-base of the planned invert slab. In order to prevent the flow of concrete from beneath these forms, a fan tail was to be inserted through the form base, at an angle, intersecting the subgrade. Both Appellant's Mr. Linamen, the project engineer, and Mr. Brown, Appellant's second project manager, testified that these forms were not designed for an indeterminate amount of overbreak and that the starter wall's bearing surface would have been dangerously reduced if the fan tail were inserted to the depth necessary to intersect undisturbed rock. Accordingly, the Board finds that these concrete forms were intended to be used in accordance with the bid plan outlined by Appellant's Mr. Garbesi.

#### C. Alleged Agreement Concerning Tunnel Foundation

In December 1977, Appellant's first project manager, Mr. Anthony Crisci, met with the MTA's resident engineer, Mr. George Matney, in the north contract tunnels. At this time, excavation had proceeded for approximately 200 feet in the outbound tunnel and 40-50 feet in the inbound tunnel. Appellant also had begun to place 2" stone for use as a haul road in these excavated areas. Mr. Crisci testified that during this meeting he proposed that the 2" stone be allowed to remain as the immediate base for the concrete structure. Under this plan, when excavation was completed, Appellant would grade the stone to an elevation just below the base plate of the tunnel rib and then excavate a trench along the centerline of the tunnel for the placement of the 12" perforated drain pipe. Mr. Crisci left this meeting with the impression that he had a "gentlemen's agreement"<sup>5</sup> with the resident engineer regarding the propriety of such a plan.

Mr. Matney's understanding of the purported agreement was somewhat different. During his testimony, Mr. Matney conceded that he had agreed that the 2" stone could remain in place in the haul road area. The haul road, however, was said to consist of that area used by Appellant to operate its heavy equipment. Heavy equipment had not been operated in the area around the tunnel ribs where the permanent concrete tunnel liner

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<sup>4</sup>This dispute arose in late February 1979. Mr. Brown, Appellant's project manager from June 1978 to January 1980, testified that the forms were ordered before he was hired.

<sup>5</sup>Mr. Matney testified that it was customary for the parties to agree to certain procedures verbally in order to reduce the volume of paperwork on the job.

eventually would be constructed. Further, both Mr. Crisci and Mr. Matney testified that the later placement of filter material never was discussed. In this regard, Mr. Matney testified that he would not have permitted the use of 2" stone in the area around the 12" perforated pipe because the haul road material had been compacted by the use of heavy machinery and had filled with mud and dirt. The 2" stone, therefore, was considered inadequate to permit proper drainage.

On the foregoing basis, the Board finds that there never was a mutual understanding between Mr. Crisci and Mr. Matney concerning Appellant's final cleanup procedure. While there was an agreement that some 2" stone could be left in place beneath the tunnel, the parties did not discuss the extent of cleanup which ultimately would be required prior to construction of the invert and tunnel liner structures. Accordingly, the Board finds that no binding agreement was entered into concerning the use of 2" stone as a base course for the placement of the tunnel starter walls.

#### V. Development of Dispute

Appellant initially began its rock excavation with the outbound tunnel on the north contract.<sup>6</sup> Work began at the portal end of this tunnel on October 24, 1977 and proceeded in a southerly direction towards the Mondawmin Station project. The outbound tunnel excavation was completed on February 21, 1979 and cleanup for the starter wall operation began on February 26, 1979. On February 27, 1979, Appellant met with the resident engineer to explain its planned procedure for both the cleanup operation and the subsequent placement of the concrete starter wall. After learning that the tunnel walls would be placed atop a foundation of 2" stone and drainage material, the resident engineer expressed displeasure and contended that the starter walls instead should be founded on firm and undisturbed rock. The resident engineer did agree, however, to inspect a prepared tunnel section to ascertain the adequacy of Appellant's planned approach. On March 1, 1979, the parties met in the outbound tunnel where the resident engineer was shown a 150 foot section which had been cleaned and prepared for the pouring of the concrete starter walls. The resident engineer left this meeting still concerned that the 2" coarse stone would not provide a stable foundation and, on March 2, 1979, wrote Appellant expressing this opinion and stating that the contract mandated the placement of starter walls on "... solid and sound material." Appellant, after receiving this letter, requested a meeting with the MTA Construction Manager<sup>7</sup>, Mr. Maddox, in order to resolve the disagreement. On March 7, 1979, the parties met with Mr. Maddox to discuss the

<sup>6</sup>Our discussion here is limited to the outbound tunnel of the north contract since this is where the starter wall controversy first arose. The decisions made with regard to this area affected the remaining tunnels on both contracts.

<sup>7</sup>The MTA retained the Ralph M. Parsons Company (Parsons) to manage the construction of the transit system. Mr. Maddox, the Parsons Construction Manager, had overall responsibility for this task. The resident engineer on each project was a Parson's employee and reported directly to Mr. Maddox's deputy, Mr. Paige Cowart.

cleanup and starter wall operations. After listening to each party's interpretation of the contract, Mr. Maddox conducted his own review of the contract provisions on the following day. He then instructed the resident engineer to issue a letter directing Appellant to place the concrete starter walls on "... firm and undisturbed rock." The resident engineer transmitted this directive on March 12, 1979 and Appellant proceeded in accordance therewith. (Tr. 490).

On March 14, 1979, Appellant apprised the resident engineer that it considered his directive to constitute a constructive change to the contract. Also on this date,<sup>8</sup> Appellant's Mr. Garbesi telephoned Mr. Maddox to complain about the resident engineer's directive. Mr. Garbesi stressed to Mr. Maddox that Appellant's procedure would have allowed for the placement of concrete on a clean, firm and well drained foundation and contended that the resident engineer's directive should be rescinded. Mr. Maddox again reconsidered his position and, on March 15, 1979, directed the resident engineer to rescind the order previously issued on March 12, 1979. The resident engineer immediately did so by telephone, and on that same date, Appellant proceeded to clean the starter wall areas in accordance with its planned approach.

Mr. Maddox's decision to rescind the resident engineer's directive was premised upon his understanding of the contract and his belief that an adequate foundation could be provided without excavating to firm and undisturbed rock. However, disagreement with this decision was widespread throughout the MTA organization. On March 19, 1979, Dr. Al Walls, the assistant contract manager for Parsons, sent a memorandum to Mr. Edward Zeigler, the manager of the Parsons geotechnical division, asking him to review the starter wall foundation preparation being performed by Appellant. On March 20, 1979, Mr. Zeigler met with Dr. Walls and expressed his opinion that the contract mandated the placement of the starter walls on undisturbed rock. Thereafter, Mr. Zeigler made several trips into the tunnel to observe the actual cleanup procedure being practiced. Mr. Zeigler testified that he saw areas where wet tunnel muck formed part of the foundation for the planned starter wall concrete pours. This, in his opinion, was unsuitable for the load bearing nature of the concrete tunnel liner.

In addition to their own in-house engineers, both the MTA's General Engineering Consultant, Daniel, Mann, Johnson, and Mendenhall/Kaiser Engineers (DMJM/KE) and Parsons retained geotechnical consultants. These consultants would visit Baltimore periodically to review whatever construction problems had arisen within their field of expertise. On March 23, 1979,

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<sup>8</sup>Mr. Garbesi testified that he believed the phone call was made on March 15, 1979. Other testimony in the case is clear, however, that Mr. Matney was requested on March 14, 1979, by Mr. Maddox's deputy, to meet with Mr. Maddox the next day concerning the starter wall problem. It appears that this request was made after the Garbesi phone call.

Dr. Tor Brekke<sup>9</sup>, DMJM/KE's consultant, was asked to visit Appellant's northbound tunnel project. While Dr. Brekke did not observe an area which had been finally prepared for a concrete pour, he did note that fresh 2" stone recently had been deposited in the tunnel, in the vicinity of the planned starter wall placement, over substantial amounts of mud. (Exh. H, pp. 16-17, 50-51). Dr. Brekke was concerned that these soft, muddy areas would result in differential settlement of the tunnel liner which would produce cracks, increase maintenance costs and perhaps reduce the useful life of the structure. (Exh. H, pp. 57-58). He therefore recommended that Appellant be required to found the starter walls on undisturbed rock. (Exh. H, pp. 26-27).

On April 2, 1979, the Parsons' consultant, Dr. Andrew Merritt<sup>10</sup>, also was asked to observe the foundations being prepared for the tunnel liner in the north outbound tunnel. While Dr. Merritt did not witness an actual concrete pour, he did study sections of the tunnel where reinforcing steel had been placed for the starter wall structure. Dr. Merritt testified that the foundations in these areas consisted of "... a layer of this number two stone overlying tunnel muck."<sup>11</sup> Based upon these observations and because he "... felt that we just couldn't rely on the tunnel muck as being a suitable foundation for the permanent concrete lining of the tunnel," Dr. Merritt likewise recommended that Appellant be required to found the starter walls on undisturbed rock. (Tr. 464).

The concerns of Drs. Merritt and Brekke, DMJM/KE, and the Parsons' staff engineers were communicated to Mr. Maddox in two separate documents dated April 4 and 5, 1979. (Rule 4, Tabs V and G). When Mr. Maddox learned through these documents that tunnel muck existed beneath the 2" stone and that Appellant's cleanup operation was not removing it, he instructed the resident engineer to redirect Appellant to place its starter walls on undisturbed rock. The resident engineer telephoned Appellant, on April 6, 1979, and verbally instructed it to proceed in the manner described by Mr. Maddox. Appellant immediately altered its cleanup procedure and thereafter performed in accordance with this directive for the remainder of the north contract and all of the south contract. During the period from March 15, 1979 to April 6, 1979, however, Appellant had poured approximately 1,800 lineal feet of starter wall in accordance with its original plan. Remedial action was not required with regard to these sections of the starter wall.

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<sup>9</sup>Dr. Tor Brekke is a professor of geological engineering at the University of California at Berkeley. Since 1960, Dr. Brekke has consulted on more than 125 projects, including hydro-electric power plants, dams, subways, highways, railroads, and mining projects.

<sup>10</sup>Dr. Andrew Merritt received a Ph. D. in Engineering Geology from the University of Illinois in 1968. He is Vice-President of Don U. Deere and Andrew H. Merritt, Inc., where he has performed services in the field of Engineering Geology and Applied Rock Mechanics since 1973.

<sup>11</sup>Tunnel muck is a heterogeneous accumulation of materials including rock fragments, sand, silt and mixed debris. This mixture tends to be wet, especially where water is flowing through the tunnel. (Tr. 460).



By letter dated April 12, 1979, Appellant again filed its notice of claim regarding the starter wall foundations on the north contract. A similar claim letter later was filed on August 16, 1979, after the resident engineer required similar cleanup in the south tunnels. The MTA Administrator denied Appellant's claims on August 24, 1979 and April 9, 1980 respectively. Timely appeals were taken therefrom and were consolidated for purposes of hearing and decision.

On August 19, 1982, the Board issued a proposed decision in the captioned appeals. Appellant filed written exceptions to this decision on September 2, 1982. The MTA responded to these written exceptions and oral argument thereafter was conducted on November 24, 1982.

### Decision

Prior to award of this contract, the MTA recognized that rock tunneling was not a precise science and that some excavation outside of the neat lines of the tunnel was likely to occur. Accordingly, the contract was drafted so as to require efforts by the contractor to minimize rock overbreak and make the contractor responsible for filling these enlarged excavation areas at no additional expense to the MTA. The dispute here involves only the type of material permitted to be used in filling any tunnel overbreak experienced beneath the design line of the concrete tunnel liner. Appellant contends that contract drawing S-11-1 (sheet no. 100, north contract) permitted it to excavate beneath the design line for the tunnel invert and starter walls and fill that opening with underdrain filter material or an equivalent. This material then would facilitate tunnel drainage and form the base for the concrete tunnel invert and liner. The MTA, however, maintains that the contract as a whole reasonably cannot be interpreted to permit the placement of underdrain filter material beneath the starter walls for the tunnel liner. Accordingly, the MTA alleges that it properly directed Appellant to fill the overbreak beneath the starter walls with concrete so as to have the tunnel liner structure effectively resting on undisturbed rock.

The tunnel typical details on contract drawing S-11-1 clearly depict an alternate excavation line proceeding from the base of the drainage system to the outside edge of both tunnel liner walls. This contract drawing further permits the excavated area between this alternate excavation line and the base of the tunnel invert and starter walls to be filled with underdrain filter material. The concrete tunnel walls, therefore, pursuant to contract drawing S-11-1, were permitted to be founded directly on a small layer of underdrain filter material.

Notwithstanding the foregoing contract drawing, the MTA contends that it was unreasonable for Appellant to conclude that the concrete tunnel liner could be founded on anything other than rock or concrete. In this regard, the MTA initially contends that Appellant was bound to examine a "Design Summary Report" which purportedly had been incorporated into the contract by reference. A review of this report, we are told, would have enabled Appellant to ascertain the vertical loads to be placed on the subgrade of the tunnel liner and with a "... very simple arithmetical calculation ..." determine that the expected vertical loads on the tunnel structure safely could have been supported only by a foundation consisting of sound rock. However, regardless of whether the "Design Summary Report" is considered part of the contract or otherwise contains information which Appellant was

obligated to review prior to bid, the circumstances here did not require Appellant to make any independent calculations to verify the design set forth in the contract plans and specifications. Consolidated Diesel Electric Corporation, ASBCA No. 10486, 67-2 BCA ¶ 6669; Ithica Gun Company v. United States, 176 Ct.Cl. 437 (1966); Harvey-Whipple, Inc. v. United States, 169 Ct.Cl. 689 (1965). Appellant had a right to rely upon the tunnel liner design contained in the contract and, by so providing this design, the MTA impliedly warranted that it was adequate for the purpose intended. Dewey Jordan, Inc. v. Maryland-National Capital Park and Planning Commission, 258 Md. 490, 265 A.2d 892 (1970); United States v. Spearin, 248 U.S. 132 (1918).

The MTA next points to a number of provisions which allegedly conflict irreconcilably with contract drawing S-11-1. These conflicts are said to be so obvious as to have imposed a duty upon Appellant to inquire, prior to bid, concerning the appropriate interpretation of the contract. Compare Beacon Construction Co. v. United States, 161 Ct.Cl. 1, 7, 314 F.2d 501 (1963); Mountain Home Contractors v. United States, 192 Ct.Cl. 16, 21-22, 425 F.2d 1260 (1970). The first contractual provision which purportedly conflicts with the alternate excavation scheme depicted on contract drawing S-11-1 is found in paragraph 3.02 F. of contract standard specification section 02990. This language expressly requires the contractor to "[f]ill enlargements of the tunnel excavation beyond the dimensions shown either with concrete or with grouted prepacking ..." The MTA interprets this language as requiring all excavated areas beyond the design line of the tunnel to be filled with concrete or grouted prepacking. Appellant maintains that even if a discrepancy exists between the foregoing provisions and contract drawing S-11-1, contract special general provision 5.03 B. provides that "[t]he Contract Drawings shall govern over the Standard Specifications."

Before applying the provisions of contract special general provision 5.03 B., it first is incumbent upon this Board to attempt to reasonably construe the contract in such a way as to avoid a conflict between the contract drawings and standard specifications. Kelley Construction Company, Inc. v. Washington Suburban Sanitary Commission, 247 Md. 241, 246 (1966); compare Sagner v. Glenangus Farms, Inc., 234 Md. 156, 198 A.2d 277, 283 (1964). In this regard, we note that paragraph 3.02 F. of contract standard specification section 02990 reasonably may be read to require concrete or grouted prepacking to be used where actual excavation exceeds the dimensions shown on the contract drawings for permissible excavation. Since contract drawing S-11-1 permitted excavation to proceed beneath the design line of the tunnel invert slab and liner, concrete fill was required only where the contractor exceeded the depicted or otherwise approved dimensions of permissible excavation. Under this interpretation, underdrain filter material could be placed beneath the tunnel invert and starter walls consistent with the alternate excavation plan shown on contract drawing S-11-1 without conflicting with the requirements of paragraph 3.02 F. of contract standard specification 02990.

During the course of the hearing in this appeal, both parties presented testimony concerning the meaning of the term subgrade. Appellant's project engineer testified that the term subgrade refers to the layer of material upon which the structure is to be placed directly. (Tr. 222). The MTA's witnesses testified that the term subgrade, in the context of a rock tunneling project, refers to rock. (Tr. 468, 647). In this regard, therefore,

the MTA further contends that north contract drawing S-11-1 conflicts with the following language contained in contract standard specification section 03300, paragraph 3.04 A:

1. Placing Ground or Subcourse

Subgrade or base course material shall be free from injurious material, well drained, and moist at time of concreting. Prior to placing concrete, thoroughly clean and dampen as necessary, leaving no free water standing on base course or subgrade and no soft or muddy spots in subgrade. (Underscoring added.)

Put another way, the MTA maintains that the foregoing provision mandates that cast-in-place concrete be poured only on a base of sound rock.

Paragraph 3.04 A. of contract standard specification section 03300 does not specify the type of foundation material upon which concrete contractually must be placed. Instead it is intended to specify the necessary foundation preparation prior to any concrete placement. Whether a structure is required to be placed on subgrade or a base course of other material thus is dependent on other portions of the contract documents. A review of the contract as a whole clearly establishes that all cast-in-place concrete was not to be poured directly on undisturbed rock. The tunnel invert slabs<sup>12</sup>, for example, indisputably were to be founded upon a base course of underdrain filter material as depicted on north contract drawing S-11-1. (Tr. 608-609). This is the same base course of material which is shown in the contract drawings as extending beneath the tunnel liner. Accordingly, we reject the MTA's contention that paragraph 3.04 A. of contract standard specification section 03300 mandated a foundation of sound rock for all concrete structures and thus do not find a conflict with the tunnel typical details contained on north contract drawing S-11-1.

Finally, the MTA contends that the tunnel typical details on north contract drawing S-11-1 are inconsistent with other contract drawings which uniformly depict the concrete tunnel liner as resting on rock. While it is true that a number of contract drawings<sup>13</sup> show the tunnel liner placed directly on a schematic rock line, none of these drawings were intended to address the excavation and fill permitted beneath the tunnel structure. Substructure excavation and fill is depicted only in the tunnel typical details appearing on north contract drawing S-11-1. Accordingly, we do not find a conflict between north contract drawing S-11-1 and other drawings intended to describe varying aspects of tunnel support and construction unrelated to excavation and cleanup.

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<sup>12</sup>The contract documents establish that the tunnel invert slab was to be constructed of cast-in-place concrete. North contract drawing S-13 (sheet 102), for example, depicts the reinforcing details for the invert structure. The unit bid item (38 N) for tunnel inverts also refers the bidder to section 03300 of the contract standard specifications entitled "Cast-in-place Concrete."

<sup>13</sup>See north contract drawings S-12-1 (sheet no. 191) and S-13 (sheet no. 102).

On the basis of the foregoing, we conclude that Appellant had a right to bid on the subject contracts based upon the assumption that it would be permitted to perform in accordance with the alternate excavation plan depicted on contract drawing S-11-1. Compare Ziebarth and Alper, ASBCA No. 25040 82-1 BCA ¶ 15,777. This is true notwithstanding the need for engineer approval thereof. To the extent, therefore, that the contract drawings permitted the concrete tunnel liner to be founded on a base course of underdrain filter material, the MTA engineer could not have withheld his approval without changing the requirements of the contract.

Appellant, however, did not seek to perform strictly in accordance with the alternate excavation plan shown on contract drawing S-11-1. Instead, Appellant proposed to construct the concrete tunnel liner on a foundation consisting of tunnel muck, a layer of 2" stone, and an 18" layer of underdrain filter material. The resolution of this dispute, we believe, thus involves a consideration of (1) whether this plan or any other alternate plan was approved by the MTA engineer; (2) whether the MTA's subsequent directive to found the starter walls on undisturbed rock constituted a change from this or some other approved excavation and cleanup plan; and (3) whether, in any event, Appellant's plan was reasonable.

At the outset, we note that Appellant's alternate excavation plan never was submitted to the MTA in writing. Notwithstanding this finding, the record is clear that the MTA resident engineer, Mr. Matney, understood what Appellant planned to do, and in fact, was shown a foundation section which had been prepared expressly to obtain his approval. Mr. Matney rejected this alternate plan due to the presence of mud beneath the layer of 2" course stone. When Appellant's Mr. Garbesi appealed this decision to Mr. Matney's superior, Mr. Maddox, the confusion surrounding this dispute began. Mr. Garbesi told Mr. Maddox that the resident engineer's position was overly restrictive and that a clean, firm and well drained foundation could be provided without excavating to undisturbed rock. (Exh. 11, pp. 22, 31, 47). While Mr. Garbesi still intended to use the alternate plan rejected by the resident engineer, he fully did not describe this plan to Mr. Maddox. As a result, Mr. Maddox was left with the understanding that the cleanup plan would include the removal of all muck, mud and other debris. (Exh. 11, pp. 22, 31, 48). The approved plan was described by Mr. Maddox as follows:

"... The intent of my discussion with the contractor was that he would bring this material down to firm materials .... firm material could be undisturbed soil, and I agree that is one definition of the term. The other definition, I felt, was if he were to bring it down to where he would clean out the materials, the muck, the debris, and so forth that existed under the starter walls themselves, under the base of the starter walls, then we would have a firm material to pour the starter walls upon.

(See Exh. 11, pp. 47-48). Mr. Maddox therefore expected Appellant to excavate the crushed stone down to a level where muck and mud were removed and the foundation was firm. Appellant intended to pour on a

foundation which included some tunnel muck. (Tr. 106-107, 168). Accordingly, there was never a "meeting of the minds" as to what constituted an acceptable alternate procedure.

In making the foregoing finding, we recognize that Appellant subsequently was permitted to pour approximately 1,800 lineal feet of starter wall in accordance with the plan it originally proposed to the resident engineer. This, we conclude, resulted from the confusion surrounding the Garbesi-Maddox telephone conversation. The MTA inspectors were told to permit Appellant to proceed based on Mr. Maddox's misconception of Appellant's procedure. When Mr. Maddox ultimately was informed that the starter wall foundation included tunnel muck, he instructed the resident engineer to order Appellant to change its procedures. On April 9, 1979, the MTA resident engineer, therefore, directed Appellant to "[c]lean all loose materials from the area on which the starter wall will be founded so that the walls found on undisturbed rock..."

Appellant contends that once an alternate plan was approved, the resident engineer could no longer order compliance with the original contract excavation and cleanup plan without changing the contract. See Northbridge Electronics, Inc. v. United States, 175 Ct. Cl. 425 (1966). While we do not quarrel with this principle, we conclude that what Mr. Maddox approved was no different than what ultimately was required. In this regard, Mr. Maddox approved a procedure wherein the 2" stone would be excavated sufficiently to remove all tunnel muck and mud. The starter walls were to be poured directly on any remaining 2" stone. What neither Mr. Maddox nor Mr. Garbesi realized, however, was that there was a layer of tunnel muck immediately bearing on undisturbed rock. Thus, to remove the tunnel muck, all of the 2" coarse stone in the starter wall area had to be excavated. This precisely is what the resident engineer ordered.

Notwithstanding the foregoing, Appellant maintains that its alternate excavation and cleanup plan was reasonable because it provided a clean, firm and well drained foundation for the starter wall. In support of this position, Appellant's project engineer, Mr. Linamen, testified that the ponding of water within the tunnel caused fine materials to flow into the voids between the 2" stones, thereby condensing the foundation and making it firm. Further, Appellant contends that Mr. Maddox was wrong to rely upon the observations of his consultants in concluding that its plan did not produce the firm foundation promised since these consultants did not view and test a section which had been finally prepared for concrete placement.

MTA's expert witnesses, Dr. Merritt and Mr. Zeigler, both testified that the ponding of water inhibited compaction. (Tr. 644, 482). Mr. Zeigler further explained that wetness in the tunnel reduced the stability of the foundation since the tunnel muck beneath the 2" stone layer remained in a constant matrix of mud. (Tr. 644). Consistent with this testimony are the observations of Drs. Merritt and Brekke, who observed mud beneath the 2" stone foundation in the starter wall areas. While it is true that these experts did not view a tunnel section which had been prepared finally for concrete placement, there is nothing in the record to suggest that all of the muck and mud beneath the 2" stone was to be removed. In this regard, Appellant's own witnesses admitted that only the top portions of the 2" stone which had been contaminated with mud were to be removed and replaced.

(Tr. 109-107, 186). Further, Mr. Matney, the MTA resident engineer who inspected a tunnel section which had been prepared for placement of the starter walls, also detected mud and silt beneath the 2" stone base. (Tr. 360).

On the basis of the foregoing, we are satisfied that (1) tunnel muck existed beneath the 2" stone foundation being prepared by Appellant for the starter walls, (2) wet conditions existed in the tunnel, and (3) the combination of these factors was sufficient to cause muddy subgrade conditions and resultant soft spots in the foundation. These soft, muddy areas could have resulted in differential settlement of the tunnel liner, adversely affecting the maintenance and durability of the structure. For this reason, and in view of contract standard specification section 03300, paragraph 3.04A,<sup>14</sup> the MTA reasonably required Appellant to remove all tunnel muck and mud and pour concrete down to undisturbed rock in the overbreak area beneath the tunnel liner structure.

For the foregoing reasons, therefore, the appeal is denied.

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<sup>14</sup>Supra, p. 16