REGIONAL FLOOD CONTROL DISTRICT

Mr. Oh Sang Kwon, P.E.
City of Las Vegas Department of Public Works
495 S Main Street, 5th Floor
Las Vegas, NV 89101

DISTRICT COMMENT(S): SUMMERLIN WEST VILLAGE 27 - DEBRIS BASIN AND OUTLET
(DS5576B) (RFCD No. 24-14538)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated May 26, 2022, Addendum No. 1 dated November 28, 2022, Supplement No. 1 dated February 2, 2023, Supplement No. 2 dated April 10, 2023, Supplement No. 3 dated August 16, 2023, for above-mentioned project as submitted by ATKINSREALIS. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated September 22, 2023.

District has the following comment(s):

1. The project proposes debris basin inlet embankments, outfall facilities, and a debris basin of the District's MPU facility GOL3 0355 and requires structural plans, calculations, per the City of Las Vegas approval letter and requires structural approval prior to the next District submittal and concurrence review. The Structural Approval Documentation and structural plan, details, and calculations must be provided with the next submittal for review and prior to District concurrence.

2. The project submittal to the District only includes the April 2023 supplement and associated improvement plans and appears to be missing the Technical Drainage Study, Addendum, Supplement, and Structural Plans as listed on the City of Las Vegas approval letter. As per typical process, provide a copy of all project material reviewed by the City for concurrence review. Comments made herein are based on the current project material provided to the District and additional concerns and comments may be provided based on the full project material and any subsequent changes to the project as a result of additional comments by the City or the District comments herein.

3. Clearly delineate a public drainage easement for the entirety of the debris basin improvements, including inlet embankments and outfall facilities. It is unclear why the proposed block and chain fence is shown outside of the flood control ROW on all details shown on Sheets 11 through 13. Provide discussion on the no-man's land between the flood control ROW and village boundary as it appears the area fronting the Red Rock Canyon National Conservation Area (RRCA) and the debris basin should

be within a public drainage easement. In addition, coordinate with the City of Las Vegas on whether the block and chain fence should be extended to the southern channel.

4. The proposed improvement plans call out an emergency spillway at the outlet of the debris basin. Per the District's Hydrologic Criteria and Drainage Design Manual (HCDDM), the emergency spillway must be designed to safely pass the PMF flow to ensure the project and downstream improvements are properly flood protected. It appears from the supplement that the spillway weir calculations were based on the 100-yr flow with sedimentation. Clarify and address to ensure the project improvements are properly flood protected.

5. Alternatively, the District recommends an emergency overflow path and analysis throughout the downstream project site to ensure the future onsite finished floors are adequately protected from flooding over the emergency spillway due to clogging or overtopping. It is noted the site downstream of the outfall facilities is currently under mass grading with no determined building locations shown on the plans and should be addressed when the site fully develops. Provide discussion on development timeframe for the downstream facilities along MPU facility GOL3 0305.

6. Provide structural plans to verify southern and northern channel slab and wall thickness and appropriate anchors and bolts for fall protection. Provide any trench details and connection details of the proposed open channels per Details I/25 and J/25 to the proposed retaining walls per Detail A/29.

7. There are discrepancies in the design Water Surface Elevation (WSE) as shown on the improvement plans and debris basin parameters report. For example, the WSE is shown as 3781.5 per Detail A/11 and overtops the emergency spillway and outlet, however, the basin parameters states a WSE of 3779.0. This must be addressed to be consistent through the report and improvement plans for this and all other details showing the WSE at 3781.5.

8. It is noted that the debris basin project proposes 12” Type II for the maintenance access road sections. The District recommends the engineer set up a meeting with air quality along with the District and City of staff to discuss final stabilization and allowable materials to prevent delays from closing out the debris basin project. Coordinate with the City of Las Vegas on air quality and NDEP requirements for the maintenance access road and other disturbed areas.

9. Address the following comments regarding the Flood Threat Recognition System (FTRS) design:

a. Coordinate with the District and hydrologist staff for the latest set of approvable FTRS monitoring station details to incorporate into the improvement plans. Revise all relevant details and references to match the latest approvable set of monitoring station details.

b. It is noted that the FTRS building called out on Sheets 8 and 9 of the improvement plans has been fully surrounded with iron fencing. However, no gate is shown on the fencing to provide access to service the FTRS building and must be provided. Clarify setback distance on the details to show a minimum of 4-ft from the building face to the proposed fence enclosure. Additionally, provide standard drawing and specification reference for the iron fence or if it will be decorative fencing or expanded metal fencing.

c. The proposed FTRS building is situated approximately 300-ft away from the outlet of the debris basin. Clarify if grading allows for relocation of the FTRS building closer to the outlet of the debris basin for sensor accuracy. If the conduit line distance to the sensor is greater than 100-ft, pullboxes with lock bars for the conduit and instrumentation line must be provided at a maximum spacing of 100-ft and clearly shown on the plans to ensure FTRS instrumentation can be properly installed.

d. Per staff discussion, a radar enclosure on swing arm is the preferred sensor instrumentation for the proposed debris basin. Coordinate with the District hydrology staff on required enclosures and specifications along the 5-ft manway / wall bench to allow for the installation of the FTRS sensor instrumentation.

e. It is unclear why two sets of conduit and ground rods are provided within the FTRS building as the design of the proposed debris basin is intended for a single sensor location. Additionally, the bench and bench details are missing from the building and must be provided.

f. Callout and provide a 2'x2' flat area on the roof to allow for installation of FTRS equipment by staff as needed.

g. Provide standpipe detail as part of the monitoring station detail and correct the mislabeled callout for Sheet DT-03 referenced on the plans.

h. Provide outlet structure sensor detail and how instrumentation will be able to be installed and connected from the monitoring station to the outlet structure.

i. Coordinate with the District hydrologist staff on specified location on the plans for installation of the radar wing arm and anchoring requirements to the proposed concrete retaining walls.

10. Address the following comments regarding the debris basin outlet structure and outfall design:

    a. Clarify the proposed outfall of the six (6) 8x6' RCB at the downstream terminus. It does not appear to reference Detail K/25 as there are no continuous retaining walls called out on the improvement plans and unclear how the six precast culverts will be placed without headwall or a similar structure at the downstream terminus. Provide additional cross section detail to clarify constructability.

    b. Provide trench detail for the proposed six (6) 8x6' RCB outfall to address constructability and the proposed means and methods of construction. Provide grout or approved material in the spacing between the boxes throughout the outfall facilities or clarify if the entire outfall from the outlet structure to the downstream terminus is to be within a monolithic concrete structure.

    c. Provide additional details for the water quality sediment wall per Detail C/25 to include material, strength, sizing of the staggered baffle blocks, and horizontal placement configuration of the blocks within the debris basin outlet to ensure constructability and adequate inspection.

    d. Clarify if there are notches in the 3.75-ft sediment wall as shown on Detail C/25 to allow clean water to pass through without the need for ponding and weir over the sediment wall. Additionally, coordinate with the City of Las Vegas maintenance staff to verify if the sediment control is adequate as the debris basin is situated at the RRCA with the potential for large quantities of suspended sediment and bedload.

    e. Clarify the difference between the 67.00 FG and the proposed 66.80 INV at the outlet structure as shown on Sheet 14. Specify joint seal detail at the connection of the concrete access ramp and outlet structure and if there is an intended drop of 0.2-ft from the access ramp to the design invert of the six (6) 8'x6' RCB. It appears from Details A/11 and D/25 that the connection is intended to be flush and must be clarified.

    f. Coordinate with the City of Las Vegas on requirement for additional trash racks or debris racks to minimize the potential for clogging in the proposed six (6) 8'x6' RCB outfall.

    g. Per Sheet 8, the proposed concrete sediment wall connects to the concrete access ramp beyond both sides of the six (6) 8'x6' outlet structure. Clarify and provide details for joint seal at the connection or if it is meant to abut the concrete access ramp.

h. Provide discussion on box sizing selection as the proposed NDOT precast box specifications allow for greater span reaches to limit the amount of culvert cells and hydraulic instability at the abutment pier between the culvert cells. Clarify and provide details for any bullnose pier at the multiple culvert cell abutments to reduce hydraulic turbulence at the abutment.

i. The improvement plans reference multiple NDOT details. Verify and ensure all referenced NDOT details are shown on the improvement plans so the final plan sets are standalone.

j. Provide fall protection at the downstream outfall for the interim condition before all-conveyance is provided to connect to the six (6) 8'x6' ERROR..

11. Provide discussion and clarification as to why a double stepped retaining wall with 5-ft manway / wall bench was proposed along the outlet structure instead of a single retaining wall. Verify if there is a limitation on retaining wall height, as it appears a single retaining wall design would be more hydraulically efficient and not submerge the 5-ft manway with the 100-yr WSE. Additionally, it would allow flexibility in the installation of the FTRS radar swing arm and allow continued readings in flood events to ensure protection of downstream development.

12. Address the following additional plan comments on the debris basin improvement plans:

    a. It is noted that a 42" guardrail is included on top of the retaining wall adjacent to the access road per detail B/25. However, no fall protection is provided along the 5-ft manway / wall bench for maintenance staff with a greater vertical fall. Address fall protection for all sections where there is a vertical fall of greater than 4-ft for protection of maintenance staff accessing and maintaining the debris basin.

    b. Slopes are shown to be 2:1 with riprap as shown on Detail C/11 along with basin profiles Y/13 and Z/13. Provide additional detail on compaction and bedding requirements of the riprap slopes regarding granular bedding and filter fabric. Note that per section 705.4.3.2 of the HCDDM, the use of filter fabric is recommended to be restricted to slopes no steeper than 2.5H:1V with additional bedding requirements. Specify compaction based upon soils report recommendations for all detail cross sections where hydraulic conveyance is required on the improvement plans. Provide clarification to address

constructability, undercutting, and sediment potential that may impact the safety and operations of the proposed onsite development.

c. Coordinate with the City of Las Vegas on cut-off wall at the inflow to the cast-in-place 20'x'6' RCB as shown on Detail C/11.

d. Clarify the concrete embankment as shown on Detail G/25. It appears the intent is to show two different scenarios with just one detail but there are no notes to indicate usage and instead details conflicting embankment and cut-off walls on top of each other. Recommend separating the details and reference the appropriate detail on the improvement plans for constructability.

e. Provide joint seal callout and detail from the concrete embankment to the flat concrete section over 6" Type II or clarify if it is meant to be a monolithic pour on Detail G/25. Additionally, it appears the proposed riprap should be shown to match the grading plans.

f. It appears the proposed 16-ft access road transitions down to a 12-ft access road at the connection at the southern inflow channel. However, the plans do not detail any 12-ft access road or transition limits / details and must be provided.

g. Verify and complete all detail callouts and sheet callouts on the improvement plans. For example, Detail Q/## is called out on Sheet 7 cannot be located on the improvement plans and SD construction note #6 does not reference the appropriate sheet.

h. Detail callout G/25 as shown on Sheet 7 does not match the detail as it would indicate the concrete section and cut-off wall ends halfway up the embankment.

i. Sheet 16 calls out a proposed 16.5-ft access road. Clarify discrepancies with detail cross sections only showing a 16-ft access road and provide additional detail as required.

j. Provide fall protection for maintenance staff along the 5-ft manway / wall bench and all sections with a vertical fall greater than 4-ft as shown on Details B/25, D/25, E/25, I/25 and J/25. The District recommends post-and-cable for the fall protection for maintenance staff along the inner retaining wall

adjacent to the debris basin in addition to the guardrail at the top of the external retaining wall.

k. Clarify the 0.5-ft concrete lip as shown on Detail D/25 as it appears it may conflict with the guardrail and anchor.

l. It is noted that the retaining wall detail as shown on Sheet 29 shows earthen backfill for the retaining wall, however, detail D/25 shows concrete access road at the connection instead. Specify and provide joint seal detail for the retaining wall where the improvement plans show concrete adjacent to the retaining wall.

m. Detail D/25 shows a slope of 14.00% for the six (6) 8'x6' RCB while the plan and profile shows a slope of 13.66%. Clarify discrepancies and ensure all details match the grading plans.

n. It is noted that the cut-off wall detail as shown on Sheet 28 shows connection to concrete with a separation joint detail. However, this does not appear to be the detail for all cases referenced as detail A/25 shows connection to Type II. Recommend providing additional detail for constructability and inspection.

o. It appears that Detail I/25 should be shown as 11-ft min as the northern inflow channel is significantly wider at the curve sections as shown on Sheet 10. Provide fall protection on both sides where the vertical fall is greater than 4-ft.

p. Add all linework referenced on the grading plans to the legends and abbreviations on Sheet 2. For example, the village boundary line as shown on Sheet 5 through 8.

13. The 2023 MPU is currently ongoing, and it is expected that the proposed debris basin and outfall alignment changes to the District's MPU Facility GOL3 0355 will be incorporated by the City of Las Vegas. Note if significant changes are subsequently made to the proposed facilities, then a Master Plan Amendment (MPA) may be required as the 2023 MPU is wrapping up facility planning and undergoing final review.

14. As noted per comment #2 above, hydraulic calculations were not provided for review. However, verify hydraulics at the downstream outfall to ensure the proposed outlet protection is adequate. Note maximum permissible flow velocity for the proposed

riprap and whether grouted riprap, cut-off walls, concrete sections, or energy dissipation may be required for proper outlet protection.

15. It is noted that certain sections of the inflow channel are above 10% slope. Note the HEC-RAS limitation that channel analysis should have slopes less than 10% as errors in the depth computation introduced by the magnitude of higher slopes becomes more significant based on the derivation of the energy equation for vertical head pressure. Additionally, steep slopes can introduce air entrainment to the flow that may not be accounted for by HEC-RAS. Provide discussion and address impacts of slopes greater than 10% in the hydraulic analysis.

16. Provide discussion on construction timing with the adjacent channel and parcel development. For example, the upstream Village 27 channel improvements by GCW have been approved which will connect to the southern inflow channel. If adjacent facilities are existing, the structural details and plans must clearly show how the connection to the existing improvements will be made to ensure functionality through the Summerlin development.

17. The approval condition #13 from the City of Las Vegas is noted that the proposed improvements does not require approval by the State of Nevada – Division of Water Resources for Dam Safety. The District recommends a courtesy submittal to the State as they have requested notification for all high-hazard structures even if it will not be subject to the State Dam permitting process.

18. The District requests to be invited for the final walk-through by the City of Las Vegas for the proposed improvements intended to be part of the ultimate Regional Master Planned system as shown on the latest adopted Master Planned Update, prior to acceptance of public maintenance by the City of Las Vegas.

19. Note that per District's Policies and Procedures Manual, Section VIII.D.13 Uniform Regulations for the Control of Drainage, the Lead Entity shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have a regional flood control significance.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in Uniform Regulations for the Control of Drainage.

The consultant must be advised to submit any revisions to the Technical Drainage Study and Improvement Plans to City of Las Vegas Department of Public Works for review/re-approval. District review of any such revisions will commence upon acceptance by City of Las Vegas Department of Public Works.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by ATKINSREALIS may be superseded. Compliance with regulatory elements and design standards specified in Uniform Regulations for the Control of Drainage does not imply a guarantee that properties will be free from flooding or flood damage.

The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY: Ching Wang (Mar 7, 2024 12:54 PST)
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Ching C. Wang, P.E.
Principal Civil Engineer

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c: VANCE SKIDMORE, ATKINSREALIS

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