CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 3, 2025
TO: **Land Development Services** Department of Community Development – Building & Safety Division				**FROM:** Tyler Key Flood Control Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
BLM 505 Phase 1 Infrastructure				95 Management, LLC
Cross Streets:	Sheep Mountain Pkwy and Centennial Pkwy			Westwood Professional Services
File Number:	F:\Depot\DSMemos\DS5838A.doc			Lucien Paet, PE, DevCo
Parcel Number:	126-26-101-004 and -005			CCRFCD
Zoning Action:				
FEMA Flood Zone	YES **X**	NO		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/5/2025	3/3/2025	See Comments Below	$400	6105124: $400
			TOTAL FEES (LDDRS):	**$400**	**----**

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. For the area located within the BLM grant, currently labeled as “future development area,” use the following comment on all of the exhibits and reports of future studies. This comment will be repeated until completed:

   This area is designated for potential future development as part of the Skye Summit Master Planned Community. Development within this area can only be incorporated into the Skye Summit Master Planned Community after the City of Las Vegas Department of Public Works approval of a Technical Drainage Study for the Kyle Canyon Detention Basin Expansion as identified in the 2023 CCRFCD Master Plan Update and vacation of the existing BLM Drainage Grant surrounding the basin. All proposed infrastructure and land use currently depicted in this area is conceptual, and not approved to be a part of the Skye Summit Master Planned Community until such time as the Technical Drainage Study is approved.

2. Provide a call out to specify which area that the note from Comment 1 applies to. Provide corresponding legend on all of the exhibits.

3. Please note that vacation or relinquishment of the BLM Drainage Grant will need to be submitted to the City of North Las Vegas upon approval of the Comment 1 from CLV and CCRFCD.

4. The BLM 505 Master Drainage Study is proposing to revise the hydrology and facility sizes identified in the Clark County Regional Flood Control District’s (CCRFCD) 2023 Las Vegas Valley Flood

Control Master Plan Update. A Master Plan Amendment (MPA) or Master Plan Change (MPC) must be submitted to the City of Las Vegas for approval and City of Las Vegas will coordinate the submittal to CCRFCD for approval.

5. The site is adjacent to or crosses an existing or proposed Clark County Regional Flood Control District (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the 505 BLM Phase 1 Infrastructure Study.

6. Please note that the site layout (pods, land use, density, infrastructures, etc.) must be approved by City Council prior to final approval of the Master Drainage Study. If the site layout does not match the Master Drainage Study, an update to the Master Drainage Study must be submitted to address the changes.

7. Please note that the traffic study must be approved prior to final approval of the Master Drainage Study. If the street layout does not match the Master Drainage study, an update to the Master Drainage Study must be submitted to address the changes.

8. Please note that the vacation of the Sheep Mountain Pkwy reduction must be approved by the City prior to the final approval of the Master Drainage Study. If the street alignment does not match the Master Drainage Study, an update to the Master Drainage Study must be submitted to address the changes.

9. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the City of Las Vegas Flood Control Section prior to final approval of technical drainage study.

10. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted POD drainage studies.

11. Building permits for the homes within the individual POD's will not be issued until construction of the street and flood control infrastructure around the POD is substantially complete.

12. Please note that the proposed 100-year flood protection facilities identified on Exhibit H1-H5 must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the master planned infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.

13. Please note that all proposed interim drainage facilities must be bonded and maintained by the Master Developer.

14. Please note that all proposed drainage facilities must meet the City of Las Vegas Municipal Code.

15. All permanent drainage facilities must be concrete lined. There must be no temporary rip rap drainage facilities remaining in the ultimate condition. Please reflect changes to all exhibit, plans, and supporting calculations with any future submittals.

16. Due to the complex nature of this review, further comments may be issued upon the overall design of BLM 505 Phase 1 Infrastructure in the next submittal.

17. Update all Stormwater Management Notes to the current CLV version.

18. The City of Las Vegas requires that all RCA have a minimum vertical wall height of five feet prior to the start of the curved arch. Many of the proposed RCA's do not meet this requirement. Update design and calculations as necessary and provide detail of the various RCA sizes so that minimum vertical wall height can be verified.

19. WSPG n-value for Velocity Calculations – Use n = 0.013 and 0.015

    a. The provided WSPG analysis used an n-value of 0.015. Provide an additional WSPG model of the system utilizing an n-value of 0.013 to determine the impacts to the velocity. For segments of pipe with velocities between 25 and 35 feet per second, 6000-psi concrete with 2-inch additional (sacrificial) thickness is required. For segments of pipe with velocities in excess of 35 feet per second, added mitigation to reduce long term impacts is required. A Special Construction Note must be added to the Grading Plans and the Plan and Profile Sheet that calls out the special construction requirement for the additional sacrificial concrete.

20. Provide D-Load calculations for all pipes within public right-of-way.

21. For all plans sets, included RCP class designation for all pipes within public right-of-way.

22. Provide the analysis of the Beltway Main GOBW 0244 and 0227 system that demonstrates the system can convey 1436 cfs as stated in Section 7.0 of the report. If this was analysis in the Master Drainage study, provide it as a reference.

23. For the Sheep Mountain Pkwy SS & SD Plans, Laterals #2, Lateral #4, and Lateral #6 do not meet HGL criteria.
    a. Lateral #2 is pressurized and I have concerns how this system will operate in the ultimate condition where the inlet is not graded into a sump. Provide analysis for ultimate condition.
    b. Lateral #4 Provide analysis for ultimate condition.
    c. Lateral #6 has an inlet that is graded into a sump. In the ultimate condition will this inlet be increased in height to meet HGL criteria? Provide analysis for ultimate condition.

24. For the Skye View Ridge Pkwy Plans, Storm Drain Lateral 1 on SD-2 does not meet HGL criteria.

    a. This pipe is pressurized and may impact the water surface elevation developed by the nomograph calculation. Provide supporting analysis demonstrating that the proposed condition will not cause unintended flow breakout that could impact downstream properties.

    b. Section 7.0 of the report notes that Phase 2 will alleviate this condition. What is the anticipated time frame of Phase 2?

    c. Since the RCB is an interim condition, the ultimate HGL of the RCA mainline does not reflect the phase 1 interim HGL which appears to be higher in the interim due to the large flow from the RCB. Provide WSPGW for RCA upstream of RCB connection and draw a second interim HGL in the applicable profile sheets.

25. According to Table 5 in Section 11 of the report, the peak 100-year stage will have 0.03' of freeboard from the emergency spillway elevation. This increased approximately 6" from the Ultimate Condition referenced in the BLM 505 MDS which will require an update. Note that the ultimate condition HEC-1 for the Ann Detention Basin will need to be updated with each subsequent development phase to verify that the 100-year peak stage does not overtop the spillway.
    a. The report notes that there is an expansion to the Ann Detention Basin. Is there an estimated construction date for this expansion?
26. On Exhibit E, Section DX5-1a includes XON3(A). It appears that the ditch down Skye View Ridge Pkwy will collect the flows and will be collected and conveyed in the SV1 system and will not be conveyed down the DX5-1a and DX5-1b ditches.

27. On Exhibit F,

    a. CPW1 looks like it should be moved to the outfall of the West Main.

    b. RD1 appears to be down the entire Skye Edge Dr. So some of the flow should be added at CPON4 and rest at CPON5. Currently all is shown at CPON5 and none at CPON4.

    c. A portion of the flow from XON4 will go to the Ann Detention Basin via the Skye Edge Dr storm drain. However, none of the concentration points that are conveyed to the Ann Detention Basin include XON4. XON4 is added to CPE2 which appears incorrect.

28. On all Facility Map Exhibits, Exhibit H1, H2, H3, H4, and H5, add the interim flows for the Phase 1 condition. Verify that facilities are adequately sized for both the Phase 1 and Ultimate conditions and that the larger flow is used for the sizing and supporting calculations.

29. On Exhibit H1, add CPE1 to map.

30. On Exhibit H5, add the column headers for the West Main Ditches table.

31. On page 244, the Grate Inlet Size Computation for SDDI #5 is for SDDI #3.

32. On page 309, in the WSPGW, the flow rate is 480 cfs. However, the plans show the flow rate as 496 cfs. Reconcile and update as needed.

33. On page 388, for Lateral 8 of the Storm Drain Hydraulic Calculations, the U/S HGL Elev appears off at 3939.00'. Check and update.

34. On page 390,

    a. For all laterals, the comment section notes Lateral from SDDI #x but it really is referring to Storm Drain Lateral X.

    b. For Lateral From SDDI #1, #3, and #4 of the Storm Drain Hydraulic Calculations, the D/S HGL Elev does not appear to match the plans. Check and update.

35. For the Outlet Weir Energy Dissipator Computation, provide the rationale for using the normal depth as opposed to the WSPGW HGL depth which would increase the wall height from 2' to 2.6' and the flow height from 6.3' to 7.2'.

36. For the Rectangular Culvert Outlet Protection Computation,

    a. The Y_n of 2.3' is noted to be referenced from WSPGW. Which WSPGW is being reference? The value of 2.3' was not able to be verified.

    b. How was the tailwater depth, Y_t, of 2.9' derived?

    c. Using the variables noted in the table, $Q/WH^{0.5} = 16.54$ and $Y_t/H=0.8$ where unable to be verified. Update calculations and revise as needed.

    d. Provide rationale for values used in calculation and make updates as needed to riprap size and length.

37. For the Stepped Structure Computation,

    a. Q appear to be 2919 cfs rather than 2460 cfs.

b. Provide calculations demonstrating that the stilling basin length is sufficient (concrete pad with riprap).

c. The plans show a weir notch at the top of the stepped structure. Provided plan detail and supporting calculation of how the weir notch will work in conjunction with the stepped structure.

d. Soil cement is proposed on the plans for the stepped structure. Provide calculation showing that the maximum allowable velocity for soil cement of 15 fps is not surpassed.

e. The plans show 13 steps but the calculation for number of steps is noted as 19 steps. Reconcile and revise as needed.

38. All of the PMF Ann Detention Basin HEC-1 calculations have a decreased cumulative area from the non-PMF Ann Detention Basin HEC-1 calculations provided. Approximately 3.01 sqmi compared to 3.75 sqmi. Provided rationale for this decrease in contributing area to the PMF HEC-1 calculations.

39. On all plan sets, provide note on all temporary facility being constructed with Phase 1.

40. On all plan sets, in the roadway cross sections where there is a storm drain, add the proposed storm drain facility and provide the dimensions from the outside of the facility to the lip of gutter and face of median. City requires a minimum of three feet from the outside of the proposed storm drain to the lip of gutter.

41. On all plan sets, provide erosion protection for all areas around major sump inlets.

42. On all plan sets, provide drivable access ramps to all major sump inlets.

43. Address the comment below from the Skye View Ridge Pkwy Plan set:

a. On sheet G-1, the median breaks to allow flow across the street to the inlets start just before the first inlets and may reduce the amount of flow that is anticipated to be captured by these inlets. Consider moving these median breaks further upstream to allow for the capture of the flow.

b. On sheet G-2,

i. Add “L” curb along median through the superelevated section from 78+50 to 82+50. Provide street cross section calculation showing that this superelevated stretch of road will meet criteria. Provide small inlet in median prior to transition to normal crown to capture nuisance flow and provide supporting calculations.

ii. Add callouts for “L” curb on both side of the street.

c. On sheet PP-3, in the profile, show the junction structure connection with the proposed RCB connection at approximately 74+50.

d. On sheet PP-4, the 18” RCP lateral is connecting to the very top of the RCA. This may be a constructability issues as the top of the RCA is relatively flat. Provide structure detail showing how this connection will be constructed.

e. On sheets PP-5 and PP-6, the proposed pipe sizes do not appear to meet the size requirements for a type I manhole per USD 401. Update and provide details as necessary. City prefers type II manhole for pipes 32” and greater.

f. On sheet PP-6, adjust SDMH #5 to the finished ground profile.

g. On sheet SD-1, Storm Drain Lateral 1 is backward from the cross section arrows and the HGL is missing.

h. On sheet SD-2,

    i. For Storm Drain Lateral 3, consider increasing the 18” RCP slope from 0.26%.

    ii. For Storm Drain Lateral 2 and 3, Finish ground profile and existing group profile appear to be swapped. If not, adjust inlets to correct profile.

    iii. For Storm Drain Lateral 1, add invert to end of RCB at connection to RCA.

i. General comment, the RCA size does not appear to meet the size requirements for a type I manhole per USD 401. Update and provide details as necessary.

44. Address the comment below from the Tropical Pkwy Plan set:

a. General comment, the RCA size does not appear to meet the size requirements for a type III manhole per USD 401. Update and provide details as necessary.

b. On sheet PP-5, update the RCA size in the profile for the segment with the length of 204.08 LF.

c. On sheet PP-11, PP-12, PP-13, PP-14, and PP-15, the lateral connection into the type III manhole does not appear to meet the standards noted in USD 401.

d. On sheet PP-13, the WSPGW shows a Q100 of 507.5 cfs for the pipe segment from station 22+70 to 24+70.

e. On sheet G-1, the west access road is missing grade tags.

f. On sheet SD-2,

    i. Q100=1177 cfs for the last segment of RCA prior to stepped structure.

    ii. The weir notch shown in plan view is missing from the profile view.

    iii. For the existing stepped structure shown as being removed, the upstream channel doesn’t appear to be removed with this or the Skye Edge Dr plan set. Should the existing steps be removed as there will likely be some flow entering the channel at this location? If so, what will replace the steps being removed?

g. On sheet D-1, the RCA shown in section A and F doesn’t look like the RCA shown in the lateral profiles. Reconcile design.

45. Address the comment below from the Skye Edge Drive Plan set:

a. On CN #11, add the sheet number where the structural detail can be found.

b. On sheet GD-1, add missing roadway tags.

c. On sheet PP-1, add invert of RCA at all grade changes and proposed manholes, typical comment for all PP sheets.

d. Sheet PP-4, provide typical storm drain labeling for the proposed storm drain segment downstream of SDMH #6.

e. On sheet PP-8, provide the water surface elevation for the graded sump condition.

f. On sheet D-1,

   i. Section G and H appear backwards from cross section arrows in plan sheets.

   ii. Section I shows a 19' Access Easement while the cross section on Sheet PP-1 shows a 40' Access Easement

   iii. Section F does not show rip-rap within the swale along the Access Trail, while it is being shown on Sheet PP-7.

   iv. Section E and J appear to also have fill conditions in the plan sheets.

g. On Sheet D-2,

   i. Section A shows a 19' Access Easement while the cross section on Sheet PP-6 shows a 40' Access Easement.

46. Address the comment below from the Sheep Mountain Parkway SS & SD Plan set:

    a. General comment, the pipe sizes do not appear to meet the size requirements for a type I manhole per USD 401. Update and provide details as necessary.

    b. On sheet SD-1, Storm Drain Lateral #1, #2, and #4 don't meet HGL criteria as noted in comment 21.

    c. On sheet D-1, cross section A, B, C, and D, provide construction detail for the SMP Trail pavement section.

47. Address the comment below from the West Boundary Drainage Plan set:

    a. General comment, the pipe sizes do not appear to meet the size requirements for a type I manhole per USD 401. Update and provide details as necessary.

48. This note is applicable when project is adjacent to BLM.

    Please contact:
    Boris Poff
    BLM Hydrologist
    702-515-5154
    Bpoff@blm.gov

49. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

50. Storm Drain Maintenance and Access

    a. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. The engineer must submit a separate set of improvement plans to CLV Streets & Sanitation Department for their review. Streets & Sanitation approval must be secured prior to drainage study approval.

51. Zoning Conditions / Tentative Map

a. Provide a copy of the zoning/planning conditions associated with this site with the next submittal to verify compliance with conditions. Flood Control will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the City Council). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

52. Structural Plans

a. Structural plans for the storm drain improvements must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the Building Department for processing. The engineer must provide a copy of Building Department approval of the structures to Flood Control prior to final acceptance of the drainage study.

53. Special Structures

a. All special structures and mainline storm drain connection require details and structural calculations to be reviewed by the City of Las Vegas Building & Safety Department. Approval by the Building Department must be obtained prior to the final approval of the subject drainage study.

54. Multi-Use Trail

a. The proposed site includes a 12-foot Multi-use Trail along Sheep Mountain Parkway. The detail of the trail section must include the 10-foot concrete sidewalk and landscape improvements approved by the City of Las Vegas Comprehensive Planning. The engineer must send one copy of the Grading plans and Detail sheet to Comprehensive Planning at the City of Las Vegas for review and approval. Provide a copy of the Planning Department approval of the 12-foot Multi-use Trail prior to final approval of improvement plans. The proposed 12-foot Multi-Use Trail must also be granted as a “Public Drainage Easement to be Privately Maintained” on the final map prior to final approval of improvement plans.

55. Storm Drain Velocity Exceeds 25 fps

a. The flow in the storm drain exceeds the maximum velocity allowed (25 fps) per the CCRFCD Hydrologic & Hydraulic Design Manual. The Engineer must provide a detail showing additional sacrificial concrete (1-inch minimum) on the plans. A Special Construction Note must be added to the Grading Plans and the Plan and Profile Sheet that calls out the special construction requirement for the additional sacrificial concrete.

56. DI more than 10’-deep

a. All storm drain inlets that are more than 10’-deep require a special structural detail and calculations. Submit structural design and calculations to City Building & Safety Department for review and approval prior to the final approval of the drainage study.

***** The City of Las Vegas Flood Control is standardizing the file naming of drainage studies and plans during the digitizing process. When saving the project files in the CD or thumb drive, please follow the system below:**

If drainage study only contains one combined file, use the following naming convention in Document Title:

1st Submittal DS and Plans (for first and original submittal);

2nd Submittal DS and Plans (for second submittal (addendum #1)) etc.

If drainage study contains multiple files, use the following naming convention in Document Title:

1st Submittal DS (for the report of the drainage study)

1st Submittal Plan 1 (could be the drainage condition maps)

1st Submittal Plan 2 (could be the improvement plans) etc.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, final approval of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

END OF REMARKS
AYS

T/R/S: T19S/R59E/S23 & S26
AREA F-10 and F-16