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Figure 1. Healthcre Corporation of America Glenbrook South Site, Hendersonville, TN



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Figure 3. Healthcare Corporation of America Glenbrook South Site Watercourses, Hendersonville, TN



Figure 4. Glenbrook South Site Proposed Conditions, Hendersonville, TN

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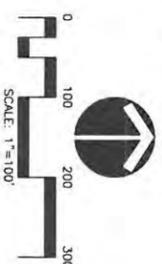
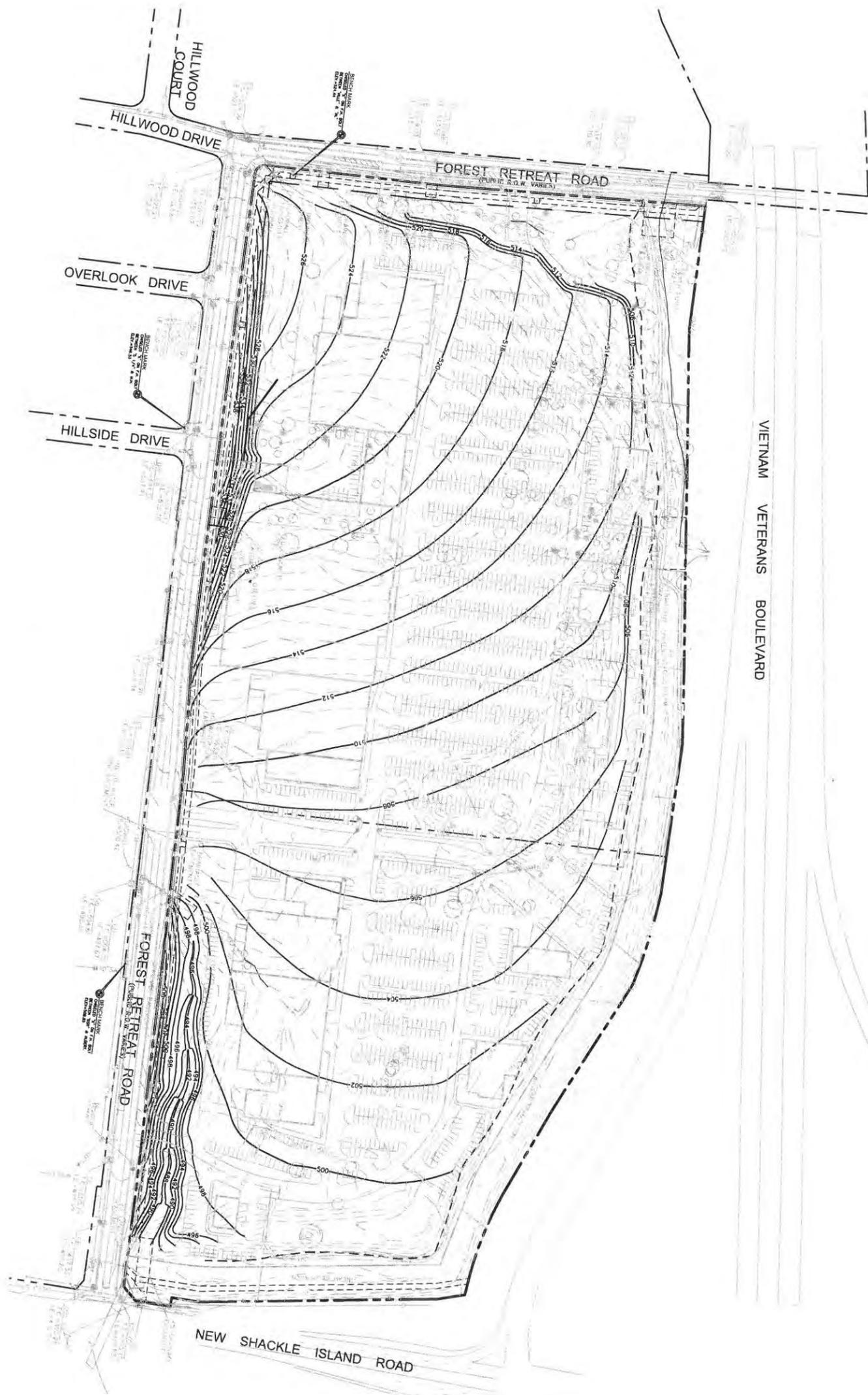
C1.1 EXISTING CONDITIONS PLAN	JOB NO.	WK. ORDER	
	99-028	9428	
	DESIGNED:	XXX	
	DRAWN:	XXX	
	SCALE:	#-##	
DATE:	PROJ. DATE	REVISIONS	

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C3.0	OVERALL GRADING PLAN	
	JOB NO.	WK. ORDER
	DESIGNED:	DRAWN:
	SCALE:	#'-##"
	DATE:	PROJ. DATE
	REVISIONS	

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Compensatory mitigation is proposed to offset impacts to 2,105 linear feet of jurisdictional streams to be filled.

The applicant is proposing to provide compensatory mitigation for the 2,105 linear feet of stream impacts (including 215 feet of S-2 previously filled, 1,560 feet of S-2 proposed, and 330 feet of S-3 proposed) via the previously constructed 2,060 linear feet of mitigation channel (S-4) and the proposed 675 linear feet of relocated stream channel for S-3.

The stream relocation is a restoration/enhancement project to minimize impacts due to the development and to ameliorate current site conditions that result in sub-optimal resource conditions. The relocation has a net benefit on the project, and for the site as a whole by removing the channel incision, bank instability and flow constriction that currently exists onsite.

A detailed discussion of why the mitigation would result in no net loss of resource value

The Applicant is aware of the guidance provided by the federal Compensatory Mitigation Rule and its hierarchy of preferred mitigation options. These options listed in order of preference include: 1) Mitigation Bank Credits 2) In-lieu Fee Program Credits and 3) Permittee-responsible Mitigation.

There are currently no stream mitigation bank credits available at a nearby project site, and given that onsite mitigation was previously approved for the site, that applicant believes that the resource is best-served by continuing to mitigate for impacts onsite. Additionally, the TDEC Antidegradation Statement {TDEC Rules of the Tennessee Water Quality Control Board 1200-4-3-.06) requires that any lowering of water quality must be necessary to accommodate important economic or social development in the area in which the waters are located. TDEC has determined that this Statement requires that mitigation be provided within the HUC-12 watershed. The available In-lieu Fee Program, the Tennessee Stream Mitigation Program (TSMP) may not be capable of providing mitigation within the smaller HUC-12 watershed. Therefore, the preferable compensatory mitigation is available onsite efforts that provide equivalent ecological services within the same area as the impact.

Monitoring plan for the mitigation site

The relocated stream channel will be monitored for five years to ensure that it serves as a improved replacement for existing channel. The results of the annual monitoring will be provided to TDEC and also USACE by the 31st of October in each monitoring year. Corrective actions will be undertaken if mitigation efforts are deemed to be unsuccessful at any point during the monitoring process.

Performance standards

Performance standards are established to meet several objectives, including measuring the success of a project's specific objectives, and comparing the ecological improvement or increase in function and value of pre- and post-restoration/enhancement efforts. Success criteria for the applicable aspects of a project (habitat assessment, vegetation, morphology, stability, and hydrology) shall consist of the following:

- *Qualitative Habitat Assessment* - The RBP Habitat Assessment score for the project reach will be greater than 75% of the median ecoregion reference score at the end of the monitoring period.
- *Vegetation*- A minimum of 200 stems per acre, comprised of both planted and desirable seedlings from natural regeneration (must be on approved native species planting list) shall remain growing at the end of the monitoring period.
- *Morphology* - The monitored morphology success criteria values for a restored reach shall not deviate from the actual as-built values by more than 20% in any monitoring year.
- *Stability*- The Channel Stability Rating must be "Good" during every monitored year.

Monitoring requirements

The success of the stream mitigation efforts will be determined by following an established monitoring plan. This plan will document the success of the constructed stream channel by monitoring stream habitat, morphology characteristics, and the establishment of the riparian vegetation both within and adjacent to the channel.

The annual qualitative and quantitative assessment of the new channel will include the following:

1. Annual narrative description
2. Habitat assessment using EPA Rapid Bioassessment Protocol (Year 5 only)
3. Annual photo documentation
4. Annual riparian vegetation survey
5. Annual channel morphology surveys
6. Annual stability assessments
7. Annual hydrology documentation

Long term protection measures for the mitigation site

A deed restriction will be recorded on the property deed to protect the mitigation area from future impacts. Sample deed restriction language is included in Appendix 3. This will cover S-4 and the proposed relocation reach for S-3. This provision was not included in the original mitigation plan.

Following the completion of the mandated monitoring period, personnel directed by site owners will visually inspect the area annually during site inspections. The annual monitoring will consist of qualitative evaluations of overall site conditions and photo documentation. The results of these annual inspections will be documented and records will be maintained by the site owners.

The new stream channel will be constructed and stabilized prior to having any water diverted into it, or filling the existing channel.

Construction of the stream channel will take place during dry conditions. If flow is present during construction, waters will be diverted via a dam-and-pump method or a flume method. Details of the water diversion method will be included in the amended SWPPP and will be submitted to TDEC for approval prior to installation.

The new stream channel will be constructed according to the enclosed plans. In-stream habitat will be provided by the introduction of clean cobble and gravel material. Banks will be seeded with native grasses and stabilized with erosion control matting.

The mitigation plan includes the establishment of riparian vegetation within the buffer that will be maintained on either side of the channel. The channel side slopes will be seeded with native vegetation and stabilized with erosion control matting for immediate bank stabilization, and a number of bare root or ball and burlap trees will be planted within the buffer. The species will be selected based on their availability, nativity to the region, growth rates, and ability to stabilize the banks. A final landscaping plan will be submitted with the site SWPPP. Emergent aquatic vegetation such as sedges (*Carex* spp.) and rushes (*Juncus* spp.) will be planted at the water's edge along the stream channel. The establishment of native riparian and emergent aquatic vegetation will be a positive influence on both the water quality and ecological attributes.



Photo 1. Unnamed Tributary to Drake's Creek (Watercourse 1), from confluence with Watercourse 5, facing upstream (3/22/2013)



Photo 2. Unnamed Tributary to Drake's Creek (Watercourse 1), facing upstream (5/14/2013)



Photo 3. Unnamed Tributary to Drake's Creek (confluence of Watercourse 1 and Watercourse 4), facing upstream (5/14/2013)



Photo 4. Unnamed Tributary to Drake's Creek mitigation reach (Watercourse 4), facing upstream (5/14/2013)



Photo 5. Unnamed Tributary to Drake's Creek mitigation reach (Watercourse 4), facing upstream (5/14/2013)



Photo 6. Unnamed Tributary to Drake's Creek mitigation reach buffer plantings by HCA (Watercourse 4), facing upstream (5/14/2013)



Photo 7. Unnamed Tributary to Drake's Creek mitigation reach (Watercourse 4), facing upstream (5/14/2013)



Photo 8. Unnamed Tributary to Drake's Creek mitigation reach with buffer plantings (Watercourse 4), facing upstream (5/14/2013)



Photo 9. Unnamed Tributary to Drake's Creek mitigation reach (Watercourse 4), facing upstream (5/14/2013)



Photo 10. Unnamed Tributary to Drake's Creek relic channel at construction crossing (Watercourse 2), facing downstream (5/14/2013)



Photo 11. Unnamed Tributary to Drake's Creek relic channel at relocation channel (Watercourse 2 and Watercourse 3 confluence), facing downstream (5/14/2013)



Photo 12. Unnamed Tributary to Drake's Creek relic channel with stagnant water (Watercourse 2), facing downstream (5/14/2013)



Photo 14. Unnamed Tributary to Drake's Creek relic channel (Watercourse 2), facing downstream (5/14/2013)



Photo 13. Unnamed Tributary to Drake's Creek relic channel with stagnant water (Watercourse 2), facing downstream (5/14/2013)



Photo 16. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3), facing upstream (2/20/2013)



Photo 15. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3) nearing confluence with Watercourse 2, facing downstream (2/20/2013)



Photo 17. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3), facing downstream (2/20/2013)



Photo 18. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3) as it enters the property, with stagnant water due to water line, facing upstream (2/20/2013)



Photo 19. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3) cement channels and culvert from Tri-Star (2/20/2013)



Photo 20. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 3) cement channels and culvert from Tri-Star (2/20/2013)



Photo 22. Tributary to Unnamed Tributary to Drake's Creek (Watercourse 5), facing upstream (3/22/2013)



Photo 21. Tributary to Unnamed Tributary to Drake's Creek as it enters property, depicting stagnant water from water line (Watercourse 5), facing upstream (3/22/2013)



Figure 2. Healthcare Corporation of America Glenbrook South Site Photo Locations, Hendersonville, TN

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