

Atlanta Regional Commission  
200 Northcreek, Suite 300  
3715 Northside Parkway  
Atlanta, Georgia 30327-2809



Harry West  
Director

May 21, 1996

The Honorable Mitch Skandalakis  
Chairman, Fulton County Commission  
141 Pryor Street  
Atlanta, GA 30303

Re: Development of Regional Impact Review - Powers Ferry Landing

Dear Chairman Skandalakis:

I am writing to let you know that the ARC staff has completed review of the proposed Powers Ferry Landing North, Phase II, Development of Regional Impact (DRI). Our finding is that the proposed DRI is in the best interest of the State. Enclosed is a copy of our final report.

We do want to note that it is imperative that, if approved, the developer coordinate wastewater disposal with the Cobb County Water System, including any stipulations which may apply, and that any transportation-related system improvements be coordinated with the Kennedy Interchange Project, if applicable. We ask that these two minor conditions requested by Cobb County be incorporated into any approvals that Fulton might give.

Also, we note the importance of stormwater runoff controls in order not to degrade the Chattahoochee water quality.

Please feel free to call me if you have any questions concerning our finding or the review.

Sincerely,

A handwritten signature in black ink, appearing to read 'Harry West', is written over a circular stamp. The signature is fluid and cursive.

Harry West  
Director

HW:skb

Enclosure:

c: Ms. Marian Eisenberg, Div. Services Dept.  
Mr. Pete Hendricks, Attorney  
The Honorable Bill Byrne, Cobb County  
The Honorable Bill Campbell, Atlanta

Mr. Marvin Madry, CRNRA  
Mr. Wayne Shackelford, GDOT  
Mr. Paul Radford, GDCA

## **POWERS FERRY LANDING NORTH, PHASE II**

Powers Ferry Landing North, Phase I, is an existing 294,000 square foot, 12-story office building on a 6.2246-acre tract bounded generally by I-285, Northside Drive, New Northside Drive and Interstate North Parkway. In addition to the existing building, the property zoning also allows construction of a 12-story, 250-room hotel. The request currently under review is to substitute a second 294,000 square foot, 12-story office building in place of the hotel, resulting in 588,000 square feet of office space.

Facility: Powers Ferry Landing North, Phase II

Preliminary Report: April 4, 1996

Final Report: May 16, 1996

## DEVELOPMENTS OF REGIONAL IMPACT

### REVIEW REPORT

#### GENERAL

According to information on the review form or comments received from potentially affected governments:

**Is the proposed project consistent with the host-local government's comprehensive plan? If not, identify inconsistencies.**

Yes.

**Is the proposed project consistent with any potentially affected local government's comprehensive plan? If not, identify inconsistencies.**

While not inconsistent with the Cobb County and Atlanta plans, the proposed development will impact both.

**Will the proposed project impact the implementation of any local government's short-term work program? If so, how?**

See above.

**Will the proposed project generate population and/or employment increases in the Region? If yes, what would be the major infrastructure and facilities improvements needed to support the increase?**

According to regional averages, the proposed Phase II development could accommodate 980 additional jobs, or a total of 1,960 for the existing and proposed phases combined.

**What other major development projects are planned in the vicinity of the proposed project?**

The nearest large scale development reviewed by ARC was the proposed redevelopment of Powers Ferry Landing West and it was denied by Fulton County

**Will the proposed project displace housing units or community facilities? If yes, identify and give number of units, facilities, etc.**

No.

**Will the development cause a loss in jobs? If yes, how many.**

No.

### **LOCATION**

**Where is the proposed project located within the host-local government's boundaries?**

The site is in North Fulton County in the I-285 Corridor. 33° 54' / 84° 26'

**Will the proposed project be located close to the host-local government's boundary with another local government? If yes, identify the other local government.**

The site is approximately one mile from Cobb County and slightly north of the City of Atlanta.

**Will the proposed project be located close to land uses in other jurisdictions that would benefit or be negatively impacted by the project? Identify those land uses which would benefit and those which would be negatively affected and describe impacts.**

The addition of another tall building in the viewshed of the Chattahoochee River National Recreation Area will have some impact on visitor enjoyment, and additional office employees using the park will also have an impact on the already crowded condition. Also, the building would need to be coordinated with Cobb County's wastewater treatment system capacity and construction of the Kennedy Interchange.

### **ECONOMY OF THE REGION**

According to information on the review form or comments received from potentially affected governments:

**What new taxes will be generated by the proposed project?**

Based on a built-out value of \$22,300,000, the development would pay approximately \$390,696 annual property tax.

**How many short-term jobs will the development generate in the Region?**

Short-term jobs would be dependent on construction schedule. New long-term jobs that could be accommodated would be 980.

**Is the regional work force sufficient to fill the demand created by the proposed project?**

Yes.

**In what ways could the proposed development have a positive or negative impact on existing industry or business in the Region?**

There are numerous office developments in this general area, including the one already existing on the site. The new building would compete with the others.

## **NATURAL RESOURCES**

**Will the proposed project be located in or near wetlands, groundwater recharge area, water supply watershed, protected river corridor or other environmentally sensitive area of the Region? If yes, identify those areas.**

**In what ways could the proposed project create impacts that would damage or help to preserve the resource?**

The proposed project site is located in the Chattahoochee River Water Supply Watershed. Under DNR watershed protection criteria, the Chattahoochee River Watershed is a large water supply watershed, larger than 100 miles. None of the DNR minimum planning criteria for large water supply watersheds apply to the proposed project site. Further, the location of the proposed project site excludes it from meeting criteria set forth in the Metropolitan River Protection Act.

The proposed site does not include any perennial streams, though it is in close proximity to two perennial streams and the Chattahoochee River. These off-site perennial streams and the Chattahoochee River can be impacted without stormwater pollution controls both during and after construction. Need for appropriate erosion and sedimentation measures during construction is essential. In addition, the amount of pollutants that will be produced after construction of the proposed development was estimated by ARC. These estimates are based on some simplifying assumptions for typical pollutant loading factors (lbs/ac/year). The loading factors are based on the results of regional storm water monitoring data from the Atlanta Region. The following table summarizes the results of the analysis:

### Estimated Pounds of Pollutants Per Year

<u>Land Coverage</u>	<u>Total Phosphorus</u>	<u>Total Nitrogen</u>	<u>BOD</u>	<u>Zinc</u>	<u>Lead</u>
Office (6.2 ac)	8.0	106.2	706.8	9.17	1.2
<b>Total</b>	<b>8.0</b>	<b>106.2</b>	<b>706.9</b>	<b>9.17</b>	<b>1.2</b>

If the development is approved, Fulton County should take steps to mitigate potential impacts. The Interim Regional Storm Water Quality Management Guidelines, adopted by the Atlanta Region, provide suggestions for addressing storm water quality. These guidelines offer technical guidance for the control of post-development pollution in storm water (find attached).

### HISTORIC RESOURCES

**Will the proposed project be located near a national register site? If yes, identify site.**

No.

**In what ways could the proposed project create impacts that would damage the resource?**

N/A

**In what ways could the proposed project have a positive influence on efforts to preserve or promote the historic resource?**

N/A

### INFRASTRUCTURE

#### **Transportation**

**How much traffic (both average daily and peak a.m./p.m.) will be generated by the proposed project?**

<u>Land Use</u>	<u>Square Feet</u>	<u>Weekday</u>	<u>AM Peak Hours</u>		<u>PM Peak Hours</u>	
			<u>Enter</u>	<u>Exit</u>	<u>Enter</u>	<u>Exit</u>
Office	588,000	5,355	670	85	115	570

The above trip generation figures were calculated using the Institute of Traffic Engineers Trip Generation (5th Edition) manual.

**What are the existing traffic patterns and volumes on the local, county, state and interstate roads that serve the site?**

The following volumes are based on 1994 GDOT coverage counts from area facilities that will likely provide the primary route for traveling to the Powers Ferry Landing (Phase II) West offices. 2010 volumes for these facilities were obtained from the ARC Regional Transportation Model.

<u>Facility</u>	<u>1994 Number of Lanes</u>	<u>1994 Volume</u>	<u>1994 V/C Ratio</u>	<u>2010 Number of Lanes</u>	<u>Forecast 2010 Volume</u>	<u>2010 V/C Ratio</u>
I-285 from Cobb County to Northside Drive	10	208,700	1.22	10	232,395	1.36
I-285 from Northside Drive to Riverside Drive	10	213,790	1.25	10	257,122	1.50
Northside Drive 2-way section from Heard's Ferry to I-285	2	5,150	.63	2	16,680	1.02
Northside Drive 1-way section from Heard's Ferry to I-285	2	5,150	.32	2	9,708	.59
Northside Drive 2-way section from I-285 to Mt. Vernon	2	5,350	.66	2	15,996	.98
Northside Drive 1-way section from I-285 to Mt. Vernon	2	5,350	.33	2	7,729	.47

The table above shows that I-285 from Cobb County east to Riverside Drive currently operates above carrying capacity. Both the one and two-way sections of Northside Drive currently operate below capacity. Future volume forecasts show that all facilities in the project vicinity, except for the one-way sections of Northside Drive, will be congested in 2010.

**What transportation improvements are under construction or planned for the Region that would affect or be affected by the proposed project? What is the status of those improvements (long or short range or other)?**

The ARC's adopted Atlanta Regional Transportation Improvement Program FY 1996-FY 2001 (TIP) includes two proposed transportation projects in the vicinity of this development:

FN-R 185 - Adding left turn lanes at I-285 and Riverside Drive. Preliminary engineering has begun, right-of-way acquisition is scheduled for FY '99 and construction is scheduled to begin in FY 2001.

CO-R 67 - Construct one-way frontage roads from Rottenwood Creek in Cobb County to Northside Drive in Fulton County. Preliminary engineering is underway, right-of-way acquisition and construction are scheduled to occur after 2001.

**Will the proposed project be located in a rapid transit station area? If yes, how will the proposed project enhance or be enhanced by the rapid transit system?**

No.

**Is the site served by transit? If so, describe type and level of service.**

Yes. MARTA bus route Number 148 runs adjacent to the project site with the nearest stop located at Riveredge Parkway and Interstate North Parkway. Morning and evening bus service is provided Monday through Friday.

**Are there plans to provide or expand transit service in the vicinity of the proposed project?**

No.

**What transportation demand management strategies does the developer propose (carpool, flex-time, transit subsidy, etc.)?**

None.

**What is the cumulative trip generation of this and other DRI's or major developments? Is the transportation system (existing and planned) capable of accommodating these trips?**

One Major Development Area Plan has been reviewed in the project area. The trip generation for the Powers Ferry Landing Phase I and Powers Ferry Landing Phase II appear below:

<u>Name</u>	<u>Weekday</u>	<u>AM</u>		<u>PM</u>	
		<u>Peak Hours</u>		<u>Peak Hours</u>	
		<u>Enter</u>	<u>Exit</u>	<u>Enter</u>	<u>Exit</u>
Powers Ferry Landing West Phase I	21,165	3,570	590	680	3,100
Powers Ferry Landing West Phase II	3,355	670	85	115	570
<b>Total</b>	<b>26,520</b>	<b>4,240</b>	<b>675</b>	<b>795</b>	<b>3,670</b>

The table above shows that both developments, if approved, at build-out, will add approximately 26,520 additional daily trips to the local road network.

This part of north Fulton County continues to experience infill development in established areas. Increased congestion on I-285 as a result of major developments will result in a degradation in the areawide transportation system. Attempts should be made to identify projects which would be included in local and regional transportation plans to alleviate traffic congestion in this area. County officials should work with the developer, ARC and the Georgia Department of Transportation to ensure the integrity and efficient interaction of the Atlanta Region's transportation facilities.

## **INFRASTRUCTURE**

### **Wastewater and Sewage**

**How much wastewater and sewage will be generated by the proposed project?**

According to regional averages, the new Phase II building could generate an additional 58,800 GPD of wastewater, or 0.06 MGD.

**Which facility will treat wastewater from the project?**

R. L. Sutton Wastewater Treatment Plant. Since this is a Cobb County facility, it is imperative that wastewater disposal be coordinated with the Cobb County Water System, including any stipulations which may apply.

**What is the current permitted capacity and average annual flow to this facility?**

The R. L. Sutton plant is currently permitted to discharge 40 MGD on a monthly average basis. The annual average was only 30 MGD in 1993. Adequate capacity exists in this plant to accommodate the development.

**What other major developments will be served by the plant serving this project?**

ARC has reviewed many large-scale developments in this sewer service area which would cause the flow to reach or exceed 40 MGD. Cobb is considering expanding the plant in the future but no firm commitment from EPD has been given. Again, it is imperative that this project, if approved, be coordinated with Cobb County.

## **INFRASTRUCTURE**

### **Water Supply and Treatment**

**How much water will the proposed project demand?**

According to regional averages, the new Phase II office building could have a demand for an additional 67,620 GPD of water, 0.07 MGD.

**How will the proposed project's demand for water impact the water supply or treatment facilities of the jurisdiction providing the service?**

There should be sufficient water for the proposed additional building but it will be important, nevertheless, to incorporate water conserving measures, including xeriscaping.

## **INFRASTRUCTURE**

### **Solid Waste**

**How much solid waste will be generated by the project? Where will this waste be disposed?**

By national averages, the proposed second building could generate 367.5 tons of solid waste per year.

**Other than adding to a serious regional solid waste disposal problem, will the project create any unusual waste handling or disposal problems?**

No.

**Are there any provisions for recycling this project's solid waste.**

None stated.

## **INFRASTRUCTURE**

### **Other facilities**

**According to information gained in the review process, will there be any unusual intergovernmental impacts on:**

- Levels of governmental service?
- Administrative facilities?
- Schools?
- Libraries or cultural facilities?
- Fire, police, or EMS?
- Other government facilities?
- Other community services/resources (day care, health care, low income, non-English speaking, elderly, etc.)?

No.

## **HOUSING**

**Will the proposed project create a demand for additional housing?**

Yes.

**Will the proposed project provide housing opportunities close to existing employment centers?**

No.

**Is there housing accessible to the project in all price ranges demanded?**

There is a limited supply of moderate-cost housing available in the area of this proposed development.

**Is it likely or unlikely that potential employees of the proposed project be able to find affordable\* housing?**

Likely.

\* Defined as 30 percent of the income of a family making 80 percent of the median income of the Region. 1996 median family income of \$52,100 for Atlanta MSA.



## Cobb County Board of Commissioners

100 Cherokee Street  
Marietta, Ga. 30090-9680  
(404) 528-3300 / Fax (404) 528-2606

Chairman  
Bill Byrne

William A. Cooper  
C. Freeman Poole  
Joe L. Thompson  
Gordon J. Wysong

County Clerk  
Carol G. Myers

April 12, 1996

Ms. Beverly Rhea  
Review Coordinator  
Atlanta Regional Commission  
200 Northcreek, Suite 300  
3715 Northside Parkway  
Atlanta, Georgia 30327-2809

RE: Development of Regional Impact  
Powers Ferry Landing North, Phase II

Dear Ms. Rhea:

Thank you for the opportunity to comment on the proposed Development of Regional Impact, Powers Ferry Landing North, Phase II. On behalf of Cobb County, I would like to request a couple of minor conditions associated with an approval of the proposed project. They are as follows:

- . Developer to coordinate wastewater disposal with the Cobb County Water System, including any stipulations which may apply.
- . Developer to coordinate any transportation related system improvements with the Georgia Department of Transportation's, Kennedy Interchange Project, if applicable.

From a land use perspective, Cobb County acknowledges that the proposal is consistent with Fulton County's Comprehensive Plan. The proposal also appears to be consistent with existing uses in the nearby area.

Again, thank you for the opportunity to comment. If additional information or clarification is required, please contact either myself or Rob Hosack, (770) 528-2191.

Sincerely,

Bill Byrne, Chairman  
Cobb County Board of Commissioners

# DEVELOPMENTS OF REGIONAL IMPACT

## Comments from Affected Parties Form

Project I.D: Z96-030, U96-015, v96-015  
(From Request for Comments Form)

Name of Commenting Organization: The City of Atlanta Bureau of Planning

Address: 68 Mitchell Street, S.W., Suite 3350, Atlanta, GA 30305

Contact Person: Dan Cohen, Melora Furman

Telephone Number: 330-6899, 6723

Do you believe your jurisdiction will be affected by the proposed development? ☒ Yes ☐ No

Please describe the effects (positive and/or negative) the proposed project could have on your jurisdiction:

The proposed development would have an impact on properties within the City of Atlanta by generating traffic on City roads to and from the subject site. It is accessible only by automobile, bus, or other road vehicle. It is segregated from nearby land uses by roads which form barriers to pedestrian access. The orientation of the property toward automobile access is problematic because it is a contributing factor to regional air pollution and to traffic congestion. Potential pollution and traffic impacts should be mitigated by 1) requiring car- and van-pooling by employees of the new office building; and 2) designing the site in such a way that access to the development by bus is possible. A bus shelter should be incorporated into the design of the site so that possible future routing of a bus line would be adequately supported by a sheltered pick-up/drop-off facility.

Other possible impacts would be negligible, for the following reasons:

- the proposed development would not be served by City of Atlanta water and sewer facilities or City of Atlanta fire, police, or emergency services;
- it would draw from a regional employment base, thereby diffusing impacts on the City of Atlanta's local economy;
- it would make no contribution to City of Atlanta taxes; and
- possible water pollution to the Chattahoochee River due to an increase in impervious surface on the site resulting from the proposed development would be mitigated by the controls specified in the recommended conditions to approval made by the Fulton County Development Services Department. (Petition No. 96Z-030NFC, 96U-015NFC, 96VC-031 NFC, R/A: Z87-175NFC, Nos. 5(e) and 5(f), p. 2-15).

(Attach Additional Pages if Necessary)

Form Completed By: Melora Furman

Title: Senior Planner,

Signature: Melora Furman

Zoning Division

Date: 4/26/96

RETURN TO: ATLANTA REGIONAL COMMISSION  
3715 Northside Parkway  
200 Northcreek, Suite 300  
Atlanta, Ga. 30327

ATTENTION: REVIEW OFFICE

FAX NO. 404-364-2599

DCA/OCP 10/7/91

## DEVELOPMENTS OF REGIONAL IMPACT

## Comments from Affected Parties Form

Project I.D: 296-030

(From Request for Comments Form)

Name of Commenting Organization: National Park Service-CRNRAAddress: 1978 Island Ford ParkwayDunwoody, Georgia 30350Contact Person: Ted WatersTelephone Number: 770-399-8089Do you believe your jurisdiction will be affected by the proposed development? ☒ Yes ☐ No

Please describe the effects (positive and/or negative) the proposed project could have on your jurisdiction:

The most obvious impact (and most difficult to place a value upon) is the viewshed which will be affected by placing yet another large building at the rivers edge. This region of Interstate 285 is already peppered with high-rise and office buildings, bridges, parking lots, apartment buildings, restaurants, telephone cell sites in addition to lots of traffic noise. Considering all the development which currently exist, it still makes placing even more congestion in this area debatable.

There would be heavier park visitor usage from the additional building employees which would use the park at lunch, before and after work hours. The park is already strained with approximately 2.5 million visitors annually. Another consideration is the increased traffic which chokes the roads along Interstate North Parkway and Powers Ferry. At times, traffic is at a standstill on Interstate North Parkway waiting to enter the parking lot at Cochran Shoals Unit of the Chattahoochee River National Recreation Area which causes a dangerous traffic condition. Can this area support yet more traffic and congestion. With the addition of more office space, there comes increased demand upon the R.M. Clayton sewage treatment plant which would receive all the affluent. There have been many large building projects underway which have to utilize this plant.

Increased visitation, automobile traffic and viewshed will all be affected should this project be allowed to go forth and should receive very careful planning and consideration.

Form Completed By: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

RETURN TO: ATLANTA REGIONAL COMMISSION  
3715 Northside Parkway  
200 Northcreek, Suite 300  
Atlanta, Ga. 30327

ATTENTION: REVIEW OFFICE

FAX NO. 404-364-2599

DCA/OCF 10/7/91

## ARC Storm Water Management Task Force INTERIM STORM WATER QUALITY MANAGEMENT GUIDELINES

### Introduction

The following are suggested interim guidelines for local governments that want to protect and improve water quality by minimizing the potential harmful impacts generated by pollution in storm water runoff from urban land uses. These guidelines are focused on practices to minimize long-term impacts of developed areas on water quality. In general, the objectives of these interim guidelines include minimizing imperviousness, providing areas to capture overland flow of storm water and allow it to infiltrate into the soil, treating other runoff that leaves a developed site and designing sites to protect water quality.

Although many pollutants in storm water runoff must be considered in storm water design, one of the primary pollutants used as a design parameter is total suspended solids, or TSS. The following table is provided as information on post-development characteristics of average annual TSS loads (pounds per acre per year) associated with various land uses and development types. The source of this information is based on storm water samples collected for the Atlanta Region Storm Water Characterization Study and is supplemented with national data for the non-urban land uses.

<u>Land Use</u>	<u>TSS (lbs/ac/yr.)</u>
Forest/Open	235
Agriculture/Pasture/Cropland	327
Large Lot Single Family (>2ac)	355
Low Density S.F. (1-2ac)	447
Low-Medium Density S.F. (0.5-1.0ac)	639
Medium Density S.F. (0.25-0.5ac)	801
Townhouse/Apartment	605
Commercial	983
Office/Light Industrial	708
Heavy Industrial	795

The Atlanta Region Storm Water Management Task Force is working to develop a detailed manual of Best Management Practices (BMPs) for reducing TSS and other pollutants in storm water runoff from urban areas. The Task Force generated the following protection measures as interim recommendations to be used until the BMP manual is completed. This guidance document includes a variety of recommended practices which are presented below as options for developers and engineers to consider in designing controls for storm water runoff quality from developed areas. These practices are options and may be used alone or in combination - selection of appropriate controls will be site-specific.

### Practice 1: Minimize Impervious Surface

This option may be most appropriately applied to larger sites. Minimizing the amount of impervious surface on a site allows for more infiltration of storm water into the ground, thereby reducing both pollutants and the runoff from the site. This approach to managing storm water runoff does not require extensive maintenance. Therefore, when possible, limiting impervious surface on a site should be encouraged. This basically involves leaving part of a site undeveloped to achieve lower percentages of impervious surface. It is recommended that impervious surface on a site be limited to the impervious surface equivalent to medium density, single family residential (approximately 1/4 - 1/2 acre average lot sizes) development. This type of development typically has 25% or less impervious surface. If a developer restricts impervious surface to these levels, construction of structural controls for water quality would probably not be necessary. Any development more dense than medium density single family residential should employ structural controls (see Practice 2 below).

The development site should be planned so that open space areas act as a pollutant filter and buffer for storm water flow from the site. Environmentally sensitive portions of a development site such as river and stream corridors and wetlands should be targeted for the undeveloped, "open space" or "greenbelt" areas. Local governments can encourage the concept of "cluster development," which allows higher levels of impervious (over 25%, for example) on portions of a site if sensitive areas are left undeveloped and maintained as undisturbed open space and they function to reduce the pollutant load in storm water runoff. Provisions should be made so that any open space areas are maintained in their natural state. If any development in these areas occurs in the future, the site would have to be re-reviewed, for storm water quality purposes, by the local government.

As a general guideline to local governments, several studies indicate that watershed-wide impervious surface amounts should not exceed 10-25% of the total land area in a water supply watershed.

### **Practice 2: Structural Controls**

If the developer selects storm water management options which involve structural controls, it is important for local governments to require that the developer submit a Storm Water Management Plan as a key component of the Plan of Development. The storm water plan should include the location, construction and design details and all engineering calculations for all storm water quality control measures.

#### Wet Ponds

This practice recommends that structural controls be designed to control water quality in addition to the quantity controls typically required by local governments. At this time, the preferred approach to achieve water quality goals is construction of wet ponds. However, wet ponds may be more appropriately suited for larger developments or a group of developments. To develop an appropriate wet pond, additional storage provided above the permanent pool, combined with an appropriately designed outlet control structure, could give the necessary control for both storm water quality and quantity. Other structural control methods such as constructed wetlands could be explored as long as they were shown to achieve the desired pollutant removal.

As an example, the following design guidelines typically achieve a TSS reduction of 65%.

- Keep pond shape simple for good circulation.
- Inlets should be widely spaced from the outlets to avoid short-circuiting.
- Length should be three to five times the width.
- At least three, and preferably six to seven feet of permanent pool depth is needed for the majority of the pond.
- An underwater shelf (approximately 6"-12" deep and at least 3' wide) around the perimeter of the pond should be planted with rooted aquatic plant species.
- The pond should be designed with a sediment forebay which is easily accessible for maintenance and periodic cleaning. The forebay should be designed so as to minimize the resuspension of previously deposited sediments. The forebay storage capacity should be about 10% of the permanent pool storage to accommodate sediment accumulations over a 10- to 20-year period.
- The pond surface area should correspond to approximately 1% of the total drainage area. The minimum drainage area is 20-25 acres; the maximum is 100-300 acres depending on the level of imperviousness in the drainage basin.
- For water quality benefits, the pond should provide storage for runoff depths as listed below. The pond volume above the normal pool required for water quality may be calculated by multiplying the runoff depth by the contributing drainage area.

<u>Land Use</u>	<u>Inches of Runoff</u>	
	<u>Sandy Soil</u>	<u>Clayey Soil</u>
Freeways	0.35	0.40
Totally Paved Area	1.10	1.10
Industrial	0.85	0.90
Commercial	0.75	0.85
Schools	0.20	0.40
Low Density Res.	0.10	0.30
Medium Density Res.	0.15	0.35
High Density Res.	0.20	0.40
Developed Parks	0.50	0.60

- Storage for flood control should be provided above the level of storage provided for water quality benefits.
- The ratio of outlet flow rate to pond surface area for each stage value needs to be at the most 0.002 cfs/ft<sup>2</sup> for the water quality portion.

#### Extended Detention with Wetland Plantings

For smaller sites, with a drainage area less than 20-25 acres, it may be appropriate for the developer to use the option of a detention facility system established to provide water quality improvement through much longer detention times in contact with wetland plantings. Research has shown that storm water impounding areas which capture the first flush of runoff in a wetland setting for several days, in concert with an outlet control system for extending the detention times of larger storms, demonstrate measurable improvements in water quality. As an example, the following general design guidelines typically achieve a TSS reduction of between 45 and 80%.

If this type of system is desired, the pond area should follow the 1% of drainage basin rule presented above. The first flush capture should be at least 1/2 inch runoff from all impervious surfaces. The bottom of the pond should be cultivated with plantings indigenous to local wetlands. The first flush should be held so as to prevent its complete release in less than a 48 hour period. Each pond should provide the forebay sediment storage area already presented, as well as layout to prevent short circuit. Water velocity through the pond should be kept as low as possible with a maximum goal of 1/2 fps. Where possible, the outlet control system should be located adjacent to a public street to allow maximum access.

#### Maintenance of Structural Controls

If structural storm water controls are not maintained properly, they will provide no benefit. The developer's Storm Water Management Plan should require the developer to submit a detailed, long-term schedule for inspection and maintenance of any structural storm water facilities included. This schedule should be consistent with the maintenance policy of the local government and should describe all maintenance and inspection requirements and persons responsible for performing maintenance and inspection activities. Provisions should be made for the local government to inspect the facilities during and after construction.

#### **Practice 3: Other Controls**

Many of the following suggested controls are applicable to all developments. In general, the objectives of the following storm water runoff controls include minimizing imperviousness, providing areas to capture overland flow of storm water and allow it to infiltrate into the soil, reducing sediment flows, and avoiding directly connected impervious surface areas.

**Building/Site Design**

- Direct roof downspouts away from direct connection with impervious surfaces.
- Use grassed swales/vegetative filter strips whenever feasible for the drainage collection system (eliminate curb and gutter). Because of decreased storm water runoff, a reduction in pollutant loads will also be realized.
- Landscape with terraces rather than aggressive slopes.
- Encourage the use of bioengineering practices to rehabilitate unstable stream channels resulting from impacts of urbanization.
- Protect and maintain natural, undisturbed buffers adjacent to streams.
- Keep development out of wetland and floodplain areas. Encourage incorporating wetlands into landscaping, upgrading wetlands where possible.
- Design and locate buildings, roads, parking and landscaping to conform with the natural terrain and to retain natural features.
- Minimize impervious surface in river and stream corridors.

**Erosion and Sediment Controls**

- Leave generous buffers or natural areas between bare land areas.
- Regrass/landscape bare soil.
- Check for volume transfer and velocities of water downstream of project to protect downstream areas from increased erosion and to prevent streambank and natural area destruction.
- For controls during construction, refer to the State Erosion and Sediment Control Act and pending State construction permit.

**Recommended References**

- United States Environmental Protection Agency, January 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters.
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