

A report on the growth or redevelopment architecture essay

[Business](#), [Industries](#)



Brownfield land is defined as vacant, inactive, or under-used belongings where growing or renovation is complicated by existent or perceived environmental taint.

Reforming and repossessing Brownfield sites is a chief portion of the UK Sustainable Development Strategy, which incorporates a broad scope of economic, societal and environmental purposes. The renovation of this Brownfield site plays a cardinal function in accomplishing the overall end of sustainability and AIDs in run intoing the UK authorityess sustainable development aims. The authorityess Sustainable Development Strategy states that ;“ guaranting a better quality of life for everyone, now and for coevalss to come. ” From this we can take four aims which are cardinal in carry throughing the above statement.

These include developing society, protecting the environment, continuing our natural resources and promoting economic growing. These sustainable development aims have three facets which are environmental, economic and societal. The design and building of this athleticss composite must use sustainable building rules in order to accomplish a successful sustainable development undertaking. These include life rhythm analysis, procurance, site design, material choice and usage, recycling of building and demolished waste, understating waste and energy ingestion. Brownfield sites have become progressively popular for development intents in recent old ages due to the little sum of available Greenfield sites, particularly in topographic points where demand for residential and commercial belongings is high. There are over 66, 000 hectares of Brownfield sites in the UK.

The Scots Executive estimates that there are 14, 000 hectares of derelict and vacant land where 30 % lies within Glasgow and North Lanarkshire. The UK is dedicated to developing Brownfield sites and has set it as a precedence. It has already exceeded its 2008 mark of edifice over 60 % of new houses on Brownfield sites, and aims to significantly turn this per centum over the following decennary.

2.

0 Main Body/ Discussion

2. 1 Issues Associating to the Redevelopment of this Brownfield Land.

The renewal and reuse of this Brownfield site involves transforming the land, which was antecedently used for heavy industries, in order to do it suited for a athleticss composite usage. This site has been used for potentially contaminative activities which will necessitate consideration as portion of the renovation of this site. A site scrutiny will help in placing the possible locations of risky stuffs and assess yesteryear and present activities undertaken at the site. Measuring the yesteryear and present utilizations at the site will place the chemicals and the countries of possible concern. As the site is considered Brownfield land it is imperative that the local governments that cover this little town make sure that successful redress is carried on the land. The old utilizations of this has to be considered as there are assorted risky stuffs associated with fabric fabrication, furniture and truck fix use which may potentially be expected and these include:

- Asbestos (insularity, fire protection and sheeting)
- Transformer oils incorporating PCBs

- Hazardous chemicals and chemical wastes
- Procedure wastes
- Poisons and toxic chemicals
- Buried munition and membranophones
- Contentss of belowground storage armored combat vehicles
- Petroleum and Oil
- CFC and halon fire asphyxiators
- Gas
- Bituminous wastes such as pitch
- Fill and contaminated dirts
- Ash waste from boilers and furnaces.

Government guidelines refering land incorporating contaminative substances is that redress should be introduced at the planning and renovation phase. There are no set criterions for redress and the criterion applied is ' suitability for usage ' . The Part IIA of the Environmental Protection Act 1990 statute law requires local governments to place contaminated land in their country and to guarantee effectual redress. Contaminated land is defined for the intent of Part IIA of The Environmental Protection Act 1990 as:" Any land which appears to the local authorization in whose country it is situated to be in such a status, by ground of substances in, on or under the land that: a. important injury is being caused or there is a important possibility of such injury being caused ; or b. pollution of controlled Waterss is being, or is likely to be caused " (Section 78A (2) , portion IIA Environmental Protection Act 1990) .

This renovation undertaking should besides be developed in conformity with Scotland ' s National Waste Strategy (NWSS) and should utilize their rules as guidelines and these consist of sustainable waste direction, publicity of the propinquity rule and autonomy in the direction of Scotland ' s waste, application of the preventive rule and the defiler pays rule, execution of the waste hierarchy harmonizing to the undermentioned precedences:

- Waste Prevention
- Re-use
- Recycling
- Composting
- Energy Recovery
- Landfill Disposal

Assorted environmental concerns have to be considered when redeveloping this Brownfield land such as traffic and noise coevals, waste disposal, bing trees and biodiversity. It is considered that research into site history, a site probe, documented files of redress and site readying are all of import elements of the planning and development procedure. This Brownfield site demands to be inspected by a practiced environmental adviser and an appraisal needs to be carried out before renovation can take topographic point.

This assessment involves analyzing the dirt, groundwater and surface H₂O by transporting out trials for risky compounds, and warrants that proper methods are exercised to cut down identified jeopardies and liabilities. This renovation undertaking must run into the current environmental ordinances.

A particular licence is necessary in order to reclaim Brownfield sites and house environmental ordinances can be inordinate for developers. If the environmental appraisal is promoting and AIDSs the renovation, so the following phase is redress. Redress of a Brownfield site is the riddance of identified contaminations to degrees regarded as safe for human wellness.

Renovation can merely take topographic point after all environmental wellness jeopardies have been identified and eliminated. If the site appraisal carried out indicates that the land in inquiry is contaminated so disciplinary steps may necessitate to be applied. Remediation methods include hydraulic steps, digging and in-ground containment techniques. Other methods such as biological and physical procedures of handling contaminations should be considered but these procedures will depend on the type and nature of the contamination. The constitution of an attention-getting environment is perceived as being of import, either affecting the redevelopment of a derelict edifice or the destruction of that edifice so as to build a new development.

The physical characteristics of this site are critical as ground-bearing capableness has deductions for topography, foundation design and H2O characteristics affect the design of the development. A portion of the site may necessitate be sterilised due to the presence of contaminations and positions of dramatic facets may restrict the edifice orientation. Conveyance is affected by the renovation of this Brownfield land, with effects for the technology and building phases of the development, in taking remedial techniques for site readying and in the concluding form of the development and its acceptableness to users.

2. 2 Designation of the Hazardous Materials from the Demolished Waste

In order to cipher the possible figure of risky stuffs contained in the edifice and the site, a method based on the appraisal and the assembly of facts can be used. This method can take the signifier of trying and proving, the aggregation of historical information and information on the stuffs used. During destruction activities, one or more of the undermentioned types of remainders may be produced: Excavated waste includes dirt, stone, sand, crushed rock, concrete, asphaltic concrete, clinker blocks, brick, minimum sums of wood and metal and inert solids used for fill or renewal.

For illustration concrete incorporating wire mesh or support may be classified as excavated fill. Concrete, clinker blocks, bricks or other clean fill stuffs that are painted with non-heavy metal-based pigments are considered clean fill. The most typical contaminations are lead and other heavy metals.

Hazardous Materials & A ; Wastes

Although a assortment of risky stuffs may be found in old edifices, lead-based pigment and asbestos are the most common points dealt with by destruction contractors. As lead and other toxic heavy metals may be held in the wastes stated antecedently, they call for cautious direction and remotion. In add-on, lead-based pigment is still manufactured for corrosion or rust protection on steel constructions and for other industrial intents. In older edifices, lead was besides used for roofs, valances, armored combat vehicle liners and electrical conduits. In plumbing soft solder, an metal of lead and Sn was used for soldering tin plate and Cu pipe articulations.

Asbestos Containing Materials

All public, institutional or commercial edifices must be inspected for asbestos before redevelopment or destruction activities. Before being aftering a destruction undertaking or getting downing the destruction, it is imperative to cognize if the edifice has any asbestos-containing stuffs and who is in charge of taking them. Buildings may incorporate asbestos in stuffs such as ceiling or floor tile, as insularity or soundproofing on ceilings, pipes, ductwork or boilers, or in wall plaster.

Polychlorinated Biphenyls (PCB ' s)

Polychlorinated Biphenyls are one of the most harmful jeopardies found in dismantled waste. A cardinal job with this jeopardy is the trouble of placing stuffs incorporating PCBs due to the little sum of informations and information available about the stuff. Electrical equipment incorporating PCBs in closed utilizations is normally clearly branded with information and indicates whether or non the component contains PCBs. PCB incorporating stuffs and elements present in edifices are usually unmarked.

Some illustrations include pigment and plaster along with elastic fillers, impregnated wood, shocking stuffs and adhesives. PCBs have been employed for a broad scope of intents in unfastened usage, for case, varnishes, waxes, man-made rosins, epoxy and Marine pigments, coatings and fire retardents.

2. 3 Elimination of the Hazardous Materials from the Demolished Waste

After designation of the risky stuffs on site and in the edifice, it is possible that the destruction waste may incorporate some of the antecedently talked

about harmful substances. It is important that during the destruction procedure a planned and concise method for the material segregation is implemented along with good site direction. This will halt the waste blending with risky stuffs. This solution maximises the sum of reclaimable dismantled waste sums.

The first phases include measuring the edifice on site followed by:

- Removal of all remains, fixtures and adjustments within the edifice.
- Depriving and taking all doors, Windowss, roof elements, warming, H2O and electric adjustments. There is a possibility that tyres and fuel containers may hold been left behind from the truck fix workshop.
- Destruction of the edifice ' s chief construction and its associated foundations.

A Waste Management Plan should be put into operation on this Brownfield site and be included in the destruction procedure.

This scheme allows the destruction waste to be isolated from the risky waste. The intent of this attack is to understate the sum of waste that requires intervention or remotion.

2. 4 Recycling of Materials for Concrete & A ; Asphalt

In order to carry through a successful sustainable renovation undertaking it is indispensable that recycled destruction waste is used for the production of the asphalt and concrete and implemented in the athleticss composite. By recycling sums and utilizing them in the building procedure a part is made

towards cut down the usage of natural resources and protection of the environment.

Construction and destruction waste contains assorted constructing stuffs such as conventional, structural lightweight, and cellular concretes and besides can include bricks, concrete masonry blocks, natural rock, portland cement howitzer, plaster, stucco, and terrazzo, gypsum plaster, ceramic stuffs, roofing tiles and herpes zoster, glass, wood, paper ; plastic, asphalt, and metals. Some of these stuffs are contaminations in concrete. So the recycling of edifice rubble presents a much greater challenge, but it can and is being done all over the universe. Recycled concrete is being used to bring forth sums for many types of general applications ; base or fill for drainage constructions ; pavement sub-bases ; soil-cement paving bases ; and new concrete for pavings, shoulders, average barriers, pavements, kerbs and troughs, edifice foundations, and even structural class concrete. Crushed brick debris may be used as an sum for lightweight concrete and crushed masonry sum from assorted types of destruction dust can be used in precast concrete.

There is a cardinal issue with utilizing these sums as it is indispensable that the unintegrated waste is free from contaminations as this can hold an consequence on public presentation in footings of strength and behavior of the finished stuff. Bitumen, organic affair, howitzer and dirt are possible substances that could be present in the stuff.

2. 5 Material Choice for the Main Sports Hall

When turn toing the pick of stuffs for this athleticss composite and in peculiar the chief athleticss hall it is of import to see the input of the recycled and rescued stuffs from the brownfield land and the energy public presentation of the selected stuffs. In order to accomplish a sustainable edifice, the energy public presentations of the selected stuffs have to be considered in concurrence with the building systems and renewable energy engineerings. Passive solar design has the possible to cut down a edifices energy usage by 50 % and more. The usage of low energy stuffs has the possible to cut down a edifices energy usage by 80 % , while the recycling and recycling stuffs can cut down the energy usage of a edifice by 40 % .

Sing that legion rescued stuffs are used to replace new stuffs that must be processed for usage, reclaimed stuffs preserves natural resources and reduces the energy usage and pollution linked with these activities. For illustration, replacing coal fly ash for Portland cement in concrete saves energy and nursery gas emanations related with bring forthing cement. The stuff construct up for the athleticss hall consists of concrete tablet foundations interconnected with concrete land beams. The structural framing is made up of an insitu concrete frame of columns and beams with dramatis personae insitu concrete floor slab. The roof design consists of a concrete level slab roof deck which supports a green roof.

The athleticss hall walls are of solid masonry with mineral wool insularity. The edifice envelope is clad in rock panels manufactured with recycled sum and aluminum glazing units provides the edifices natural visible radiation.

The athleticss hall flooring is finished with a solid lumber floor. The followers is an outline specification for the stuff choice for the athleticss hall ;

Sub-structure Development

Structural hardcore is an engineered fill that is built up in beds and compacted to a designed thickness. Coal fly ash, bottom ash, scoria, and exhausted metalworks sand can wholly be used as structural fill. Concrete can be crushed and used onsite as hardcore. Excavated clay after segregation can be used in topographic point of natural dirt as support stuff for the edifice site and can besides better dirt quality. Scrap tyres, blast furnace scoria and recycled concrete can be used as backfilling around the edifice foundation for superior drainage, insularity, and wall force per unit area aid.

Foundations & A ; Structural framing

The bing masonry edifice on the Brownfield site may be used to bring forth sum that can be used for the concrete foundations and insitu-concrete frame. The recycled sums can help in beef uping the overall tenseness and cut down the measure of steel support required in the foundations and the frame. It is indispensable that all stuffs are sourced locally to help in the Hunt of sustainability. These sums can be graded and made to accommodate different concrete mix types. Conventional concrete sum consists of sand and assorted sizes and forms of crushed rock or rocks and can be used in a broad array of edifice applications. Reclaimed stuffs can be recycled in cement and concrete in many ways and used for these concrete elements. Here are a few illustrations:

- Fly ash and land granulated blast furnace scoria can be used as partial cement replacements. Using these stuffs can bring forth stronger, longer-lasting concrete.
- Portland cement itself can be made with fly ash, FGD gypsum, foundry sand, recycled gypsum drywall, blast furnace, and steel scoria.
- Concrete sums can include bottom ash, foundry sand, crushed concrete, and blast furnace scoria.
- Recycled-content foundation blocks.

The chief energy benefit of utilizing concrete in edifices is its high thermic mass that leads to thermal stability. This saves energy and produces a better indoor environment for constructing users.

Constructing Envelope (Walls & A ; Insulation)

The edifice shell is similar in its demands with our skin tegument, which is a waterproof, vapour-transmitting, self-repairing, sensitive membrane incorporating signal-transmitting nervous terminations and warming and chilling systems all within a few millimeters of its surface. Reclaimed blocks can be reused in new block wall building.

Masonry blocks are made from cement and sum. Slag cement, fly ash, or silica smoke can replace partly for cement. Bottom ash, blast furnace scoria, and recycled concrete sum can replace for freshly mined stuffs. Recycled wallboard can be used for new wallboard and cement. Air-cooled blast furnace scoria can be used to bring forth mineral or stone wool insularity.

Cladding

The facing system for this proposed athleticss composite is imperative in footings of thermic public presentation, natural visible radiation and H₂O incursion. Manufactured rock panels, which consist of concrete mixed with sums, are used as edifices primary cladding stuff. Fly ash can be used in the production of manufactured rock.

The weight of the rock provides a mass factor that absorbs the ambient air temperature and releases this stored energy throughout the twenty-four hours or dark. This energy public presentation consequences in warming and chilling cost nest eggs.

Shocking

The athleticss hall requires a specific surface. Salvaged timber or recycled wood can be used as the shocking stuff. Crumb gum elastic which is a all right granular or powdery gum elastic capable of being used as the resilient flooring carpet pad. It is recovered from bit tyres utilizing thermic and/or mechanical processing techniques. This would be a sustainable option and under floor insularity can be comprised of mineral wool or foamed glass.

Roofing systems

Green roofs are roofs covered with workss ; they cut down storm overflow and supply insularity.

Scrap tyres can be used to do gum elastic tile for paseos. Bottom ash can be used as bedding stuff. Clean wood, recycled gypsum drywall, and

composition board can be land and used as dirt amendments in both green roofs and landscape gardening applications.

Reconstituted or recycled facias, soffit or trims can be reused in roof design. There is a possibility for recycled carpet pad and/or sheathing for reuse in orientated strand board. Due to the high measure of insularity that they provide, green roofs are acknowledged for their capacity to supply an exceptionally changeless temperature right through the twelvemonth.

During the winter they keep the heat in, and in the summer they provide a comparatively cool environment. Recycling concrete sums for usage in new concrete for the assorted edifice elements can assist better the stuff and overall edifice energy public presentation. The advantages of utilizing big sums of concrete in the athleticss complex include ;

- Optimizing the benefits of solar addition, so cut downing the demand for heating fuel.
- Reduces heating energy ingestion
- Centrists fluctuations in internal temperature.
- Can cut down the energy costs of edifices.
- Makes best usage of low-temperature heat beginnings such as land beginning heat pumps.
- The decreases in energy usage for both warming and chilling cuts emanations of CO₂
- Will assist future proof edifices against clime alteration.

2. 6 Issues Associating to the Design of Sustainable Urban Drainage System

At the minute SUDS are going more widespread in Scotland, but there is a general position that they are inappropriate for usage Brownfield sites. This guess is unproved as any jobs related to set down taint are tackled during SUDS design. It is known that the pick of SUDS systems will be determined by the ' suitable for usage ' criterion of re-development. SUDS present a scope of techniques which can be chosen to run into the peculiar demands of a development site. In several cases, utilizing SUDS in Brownfield sites is in fact of greater significance, due to the on-going environmental demands.

Brownfield sites are often situated where big watercourses are contaminated by urban drainage and where urbanization has intensified deluging. SUDS will guarantee that taint and implosion therapy are non amplified by the new development. Where a site is supplied by an big corporate strategy the integrating of SUDS may diminish the discharge of natural sewerage from storm floods in the downstream drainage system. The move towards utilizing SUDS on Brownfield sites must be included at the initial phase of the renovation design. If a site is affected by taint, SUDS must non trip contaminations or act as a passageway to convey such contaminations. SUDS design can guarantee that this does non take topographic point. SUDS methods can besides be modified to pull off infinite deficits and hapless dirt infiltration. Brownfield sites on a regular basis have a high wildlife home ground and SUDS present a opportunity to continue and develop biodiversity.

A successful SUDS strategy will necessitate the interior decorators to organize with the stockholders as portion of the development process. The design squad and investors should see SUDS at the feasibility phase of the development and at each subsequent phase so that the best possible sustainable solution can be achieved. The retrofitting of SUDS as a drainage solution on brownfield sites might necessitate added affairs to be considered, such as the separation of combined cloacas. An array of issues need to be considered and assessed for suited SUDS planning and design for this peculiar site, which further substantiates the significance of early treatments and conceptual design work. Assorted be aftering facets need to be considered, where guaranteeing the SUDS strategy meets local environmental and community aims is imperative along with procuring long term running finance from the hereafter proprietor. Site controls should be linked in with regional enterprises.

The civil technology design is a cardinal issue in SUDS design where appraisals have to be carried out to cipher the overflow response from the proposed development. Hydraulic, structural and geotechnical design plays a major function in planning a SUDS strategy. Alongside the technology design, hydrology is analysed where appraisals of groundwater hazards, infiltration public presentation and dirt suitability are all studied. Landscaping and ecology are besides of import factors in the SUDS planning and design model. Landscaping and planting is considered in combination with the integrating of SUDS into the urban landscape and the development of the appropriate direction programs.

The site design and direction assistance in maximizing ecological value.

During design of a SUDS strategy, the building phase has to be history in footings of buildability, building procedures and the building programme. The long-run care demands of SUDS have to be considered at the planning and design phase. Maintenance of SUDS differs from that for conventional systems, so it is of import to apportion duty for the care of SUDS early in treatment before be aftering blessing for the development is given. The drainage solution adopted for this peculiar undertaking could consist the undermentioned constituents:

- Permeable surfaces.

A surface that allows the influx of rainwater into the implicit in building or dirt.

- Treatment swales.

Shallow vegetated channels that hold H₂O, and may besides let infiltration.

- Detention basins.

Attenuate roof and paving overflow.

- Filter strips.

Vegetated countries of gently inclining land which are intended to run out H₂O off impermeable countries and to filtrate out silt and other remainders.

- Filter drains.

Linear drains dwelling of trenches filled with a permeable stuff, normally with a pierced pipe in the base of the trench to help drainage and shop H₂O.

- Bio-retention country.

Vegetated countries designed to roll up and handle H₂O before release via a piped system or infiltration to the land.

- Infiltration devices.

These devices are sub-surface constructions which encourage the infiltration of surface H₂O to land. They can be trenches, basins or soakaways.

- Green roof.

Vegetated roof that reduces the volume and rate of overflow and removes pollution.

- Conventional organ pipe to convey flows from detainment basins to pond.

A series of conduits and their accoutrements normally laid belowground that base on balls on surface H₂O to a suited location for intervention or disposal.

3. 0 Decision

This Brownfield renovation in Scotland has the chance to extinguish environmental wellness jeopardies while besides moving as a mechanism for community regeneration. Involving this community in this undertaking can assist supply elaborate information about past activities on the site.

This undertaking is efficaciously managed as a sustainable renovation strategy where this Brownfield site can supply development chances, generate chances for employment, promote societal inclusion and coherence, supply good handiness for all to green countries, understate the

usage of un-recycled resources, protect biodiversity and the natural environment and combat the impacts of climate alteration. The issues stated in the brief are tackled by the author in this survey. The three dimensions of “ sustainable development aims ” are strongly looked at in concurrence with the issues associating to the renovation of Brownfield Land. The information assembled in this study covers risky stuffs designation and riddance from the dismantled waste, along with an analysis of the chance of utilizing recycled masonry debris and other rescued stuffs in the production of assorted elements of the athleticss composite with an accent on energy public presentation. A elaborate scrutiny of the issues environing the design of a Sustainable Urban Drainage System (SUDS) for this peculiar development is besides provided. It is clearly apparent that there needs to be a incorporate attack in order to run into the sustainable development aims.

It is obvious that the building industry has a cardinal portion to play in the pursuit of sustainability. The authorities ‘ s sustainable development aims should drive the building sector towards accomplishing these aims which will ensue in “ a better quality of life ” .

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